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# Avoiding Clean Air Act Enforcement Actions

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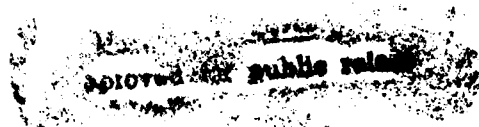
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# Preface

The Logistics Management Institute was tasked to determine the causes of the notices of violation received by the Army under the Federal Clean Air Act (CAA) as amended on November 15, 1990. On the basis of a review of the violation citations and through telephone interviews with environmental staff members at all the cited installations, we identified several very consistent violation patterns. These patterns are discussed in this report. Additionally, the impacts of the sweeping changes to the CAA caused by the Clean Air Act Amendments of 1990 are also discussed.

This report is not a detailed, formal evaluation of the Army's Clean Air Act Compliance Program. This report is intended to provide an overview of the CAA requirements, an evaluation of the Army's Air Pollution Control Program through the evaluation of enforcement actions, and our opinions about the forthcoming impacts of the new legislation. We provide information from which management can make informed decisions regarding initiatives to enhance compliance with the CAA and its 1990 Amendments.

This is the seventh report in our series on compliance issues. Aside from general compliance data handling, our earlier reports considered enforcement actions under the Safe Drinking Water Act, the Toxic Substances Control Act, and the Clean Water Act.

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## Avoiding Clean Air Act Enforcement Actions

# Executive Summary

A 1993 Army Compliance Tracking System (ACTS) report indicates that 70 Army installations held Clean Air Act (CAA) permits; a total of 510 permits had been issued. The total number of air emissions sources was nearly 2,500 in 1989; but for convenience, multiple sources are generally included on a single permit. (At one installation alone, more than 200 minor sources, several major sources, and several permits are known to exist.) Some states issue a single permit for the entire installation. Regardless of how air emissions sources are counted, the Army is subject to the CAA on a large scale.

The existence of many enforcement actions (EAs) must not obscure the reality that the overall compliance of the Army's air pollution sources has been very good: Less than 1 percent of permitted sources failed to comply during a 6-year period. Compliance for major sources (generally heating plants and incinerators, emitting more than 100 tons per year of any of the primary pollutants) was even better.

From 1984 to 1989, the Army's Air Pollution Abatement Program ranked third in the number of EAs received at Army installations, behind the Wastewater and Hazardous Waste Programs. Army-wide, 114 air-related EAs were received during the 6-year period (an average of 19 EAs each year). Nearly 75 percent were recorded as being correctable without capital abatement projects. The Defense Environmental Status Report did not record why each EA was received.

Recent modifications (as recommended in an earlier Logistics Management Institute study) to ACTS included the addition of reason codes and corrective action codes for EAs. ACTS was used to review the EAs resulting from failure to meet the CAA standards during the period November 1990 through January 1993. Again, the majority of EAs (75 percent) were due to sampling, recordkeeping, and similar administrative or procedural errors that can be corrected at the installation level with limited additional funding, more effective training, and continuing supervision.

We investigated 55 separate EAs from 22 Army installations in even more detail, interviewing the installations' environmental staff members to determine the reason each EA occurred and its underlying cause. Our analysis identified four primary underlying causes: lack of environmental knowledge, lack of management attention (poor supervision), contract problems, and lack of resources. These underlying causes are often cited together as the joint causes of specific EAs. Again, the trends suggested by the Defense Environmental Status Report

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## CHAPTER 1

# Summary of the Clean Air Act and Clean Air Act Amendments of 1990

This report describes the major regulatory requirements under the Clean Air Act (CAA), reviews the historical and most recent enforcement action (EA) data, discusses the underlying causes of the EAs, forecasts the impacts of regulations on Army activities, and recommends improvements for the Army's Air Pollution Abatement Program.

## INTRODUCTION

One of the Army's greatest challenges is to integrate its national defense mission with the protection and enhancement of the Nation's air quality. This challenge becomes more complex each year as the Army is faced with meeting and/or exceeding the standards established (and made continually more stringent) by complex Federal, state, and local air pollution laws. The goals of the Army Air Pollution Abatement Program are as follows:<sup>1</sup>

- ◆ Control emissions to meet regulatory standards and protect health.
- ◆ Procure commercial equipment and vehicles that meet standards.
- ◆ Ensure that each piece of military equipment is designed, maintained, and operated to meet applicable regulations.
- ◆ Monitor and maintain the ambient air quality at installations.
- ◆ Cooperate with regulatory authorities to meet air quality standards.
- ◆ Comply with all Federal, state, and local regulations concerning air quality.

To achieve these goals, the Army is spending hundreds of millions of dollars each year on environmental compliance activities — yet EAs continue.

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<sup>1</sup> AR 200-1, *Environmental Protection and Enhancement*.

# GENERALIZED AIR POLLUTION CONTROL SYSTEM

Air pollution results from direct (intentional) emissions to the air as part of a process (such as the commonly portrayed smokestack) and as a result of indirect emissions through substance volatilization (such as the vapors emitted during vehicle fueling). Emissions may or may not be visible.

Because of the diverse nature of combustion and volatilization processes, there are many potential sources of air pollution on an installation. This results in a situation quite different from water pollution, where a generally limited number of sources require only a small number of highly specific permits. Air pollution sources are addressed under the permitting process in a variety of ways, depending on the preferences of local regulators. An installation may have a single, very complex permit; several common-process or common-source permits (for instance, all boilers or all sources within a defined area on one permit); or separate permits for every source of emission.

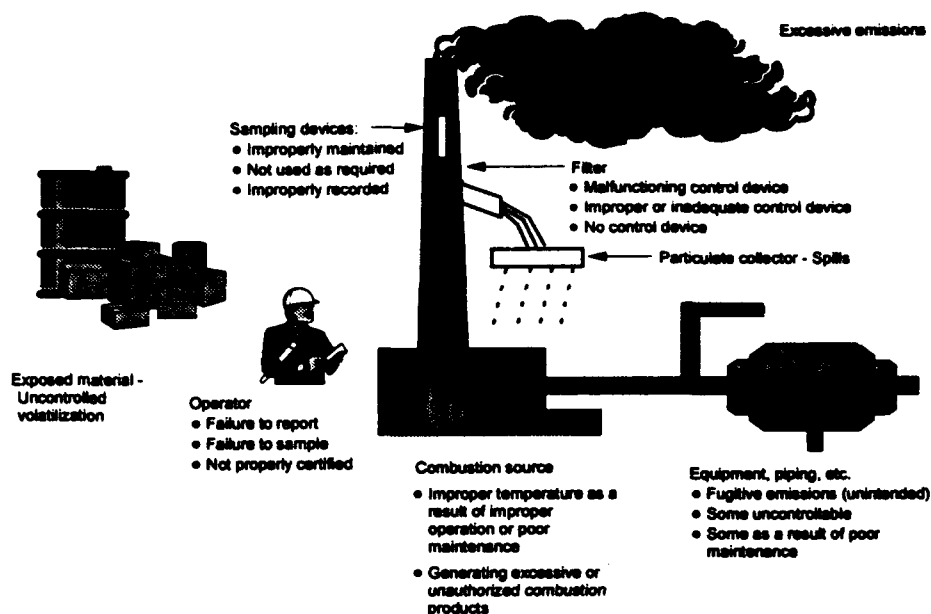
In general, sources emitting air pollutants must be equipped with some form of pollution control device. Such devices must meet specified control effectiveness levels; they must be maintained properly. Records of emission levels and maintenance must be kept. Smaller sources (such as heating furnaces) may be exempt from control requirements but will be counted against a total emissions level provided for in the permit. Sampling (or approved emission estimate calculations) is usually required to document that pollutant emission levels are not exceeded.

As a rule, air pollution control devices are quite simple in concept. They consist of filters, water washers, centrifugal settling chambers ("cyclones"), or electrostatic devices. In each case, the objective is to remove pollutants from the exiting air stream. Upon removal and capture, the trapped pollutants (and contaminated control device parts such as filters) become solid wastes. Figure 1-1 shows a notional air pollutant source with several possible pollution control devices. It illustrates the points at which EAs might be expected to occur.

## REGULATORY FRAMEWORK

The regulatory mechanism for accomplishing national air pollution goals is a permit system whereby sources of air pollution are subjected to quantity limits on their emissions and to procedural requirements in order to obtain the permit to operate. The limitations vary depending upon the nature of the pollutant being emitted and upon the overall quality of the air in the region where the source facility is located. In general, EAs are issued for violations of the terms of the permit as a result of excessive emissions or procedural errors.

The basic framework of the permit system was established in the CAA of 1971; major new amendments in 1977 and 1990 expanded the scope of regulated activities but did not greatly change the mechanisms of regulation.



**Figure 1-1.**  
*Generalized Air Pollution Source and Associated Trouble Spots*

## The Clean Air Act Prior to 1990

The portion of the CAA whose effects are best known to the public — the local/regional identification of nonattainment of national standards for air quality — was initiated under the 1977 Clean Air Act Amendments (CAAA), in which the U.S. Environmental Protection Agency (EPA) was directed to develop health-based air quality criteria, establish National Ambient Air Quality Standards (NAAQS) based on those criteria, and set emission standards for both stationary and mobile sources of emissions.

By direction, EPA identified acceptable levels for seven major classes of air pollutants: sulfur oxides, carbon monoxides, photochemical oxidants, hydrocarbons, nitrogen oxide, lead, and total suspended particulate matter. Air quality regions were established throughout the country; they are classified as "attainment" or "nonattainment" areas on the basis of the regional air quality relative to the NAAQS. For each Army installation, Appendix E identifies whether it is in an attainment area. As with most EPA programs, the states are tasked with administration of the program; states must develop state implementation plans (SIPs) that contain the abatement requirements designed to achieve compliance with the NAAQS through control of air pollution sources.

In support of achieving the NAAQS, EPA developed other standards that apply to specific facilities; the standards follow the same pattern everywhere but are more stringent in nonattainment areas. New source reviews are required where any new source is expected to emit more than 100 tons of any pollutant or where existing sources change operations so as to emit specified increases in pollutants. Stringent limitations are placed on sources that begin operating (or modify operations) after the standard has been adopted; these standards are not retroactive to pre-existing sources. In nonattainment areas, these standards are known as New Source Performance Standards; in attainment areas, they are called Prevention of Significant Deterioration programs. A minor but powerful provision of the law is that new permits will not be issued to a source owner unless *all* sources owned that are located in nonattainment areas are in compliance with the CAA.

National Emission Standards for Hazardous Air Pollutants (NESHAPs) place direct controls on sources that emit specified hazardous air pollutants: asbestos, beryllium, mercury, inorganic arsenic, coke-oven emissions, vinyl chloride, benzene, and radionuclides. The emissions of other pollutants are controlled over the long term by the fact that as operating permits are renewed every 5 years, sources must meet the ever-tightening standards current at the time of reissue. However, source owners may "bank" and "trade off" emission credits, keeping a source in operation even though it does not meet standards by eliminating a greater pollution source in the area. These banked emissions credits have become a marketable commodity. The Army has not yet entered this market, but with its many facilities (especially in view of base closure actions) it should do so.

The cornerstone for compliance with the CAA standards lies in the permit system. In general, the states implement the permit program. The permit is the document that specifies all the procedures that must be followed to remain in compliance with the law. EAs are issued for failure to operate in accordance with the terms of those permits and documents.

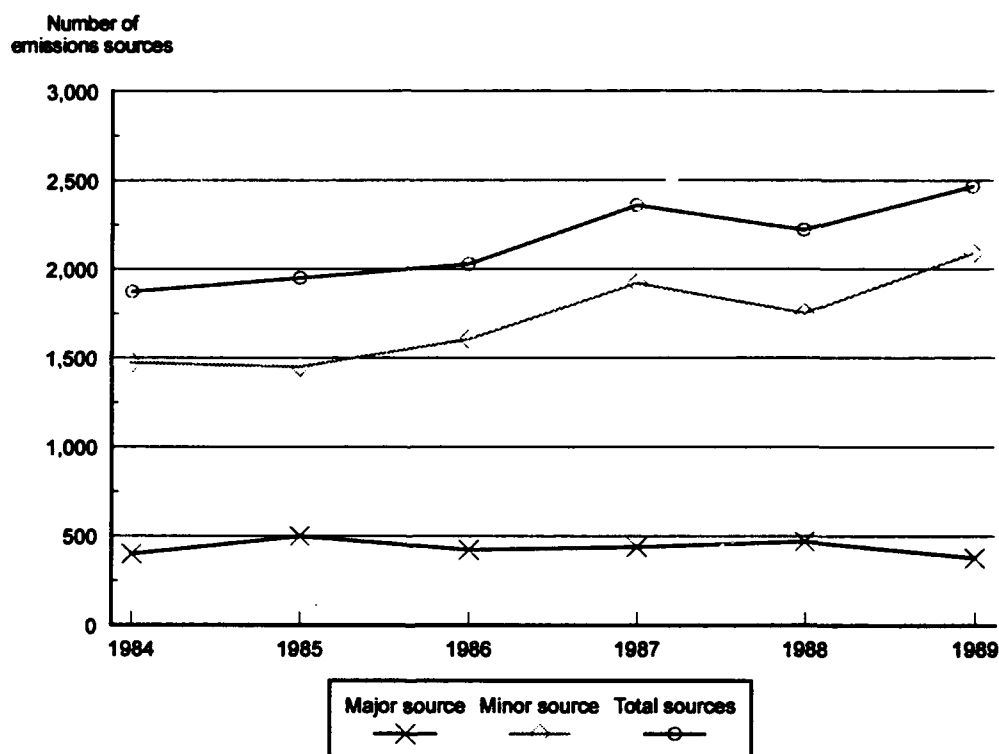
## The Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (CAAA-90) are the most comprehensive and far-reaching pieces of legislation promulgated since the Resources Conservation and Recovery Act (RCRA). Some have termed the CAAA-90 the "RCRA of the 90's." The CAAA-90 are, for all practical purposes, a total revision of the CAAA of 1977; most of the provisions do not take effect until 1995 or later. When fully implemented, during the course of the next 20 years, CAAA-90 will have major effects not only on the traditional major sources of air pollution, but they will also impact many sources not previously regulated. In Chapter 5, we provide additional information on the CAAA-90 and their potential impacts. The EAs received by the Army until now have been based on the earlier version of the CAA.

## Army Exposure to the Clean Air Act

As of the 1993 Army Compliance Tracking System (ACTS) report, 70 Army installations held 510 CAA permits. The total number of air emissions sources was nearly 2,500 in 1989 (at one installation alone, more than 200 minor sources and several major sources exist). For convenience, multiple sources are generally included on a single permit. Some states issue a single permit for an entire installation.

The ACTS does not record the actual number of permitted sources. The most recent data come from the old Defense Environmental Status Report (DESR), and they are shown in Figure 1-2. In addition, the ACTS data are believed to be understated, as 89 installations are recorded as being in nonattainment areas and more than 125 installations report some type of CAA-related information in ACTS.



Emission sources	1984	1985	1986	1987	1988	1989
Major sources	399	499	422	439	470	377
Minor sources	1,473	1,450	1,605	1,919	1,750	2,090
Total sources	1,872	1,949	2,027	2,358	2,220	2,467

**Figure 1-2.**  
*Total Number of Permitted Emission Sources at Army Installations*

While the numbers and method of recording data may vary and be open to question, it is clear that the Army is subject to the Clean Air Act on a large scale.

## AIR POLLUTION CONTROL REGULATION ENFORCEMENT

### Background

The cornerstone of the Federal air pollution control regulations is the designation of geographic areas in which air quality is measured against national standards. Air pollution issues are managed on the basis of the status within each area and are managed by air quality boards established for each area. Boards differ in procedures and expectations. As a result, Army installations deal with a wide range of regulatory entities that are quite different from the traditional state or Federal regional environmental offices with which installations usually conduct business.

In general, air pollution control regulations address three general requirements: operation of control systems, monitoring and sampling activities, and documentation. Failure to comply with those regulations can result in EAs that carry fines of as much as \$25,000 per day of violation. Although the maximum fines are seldom if ever levied, the fines commonly issued under the CAA do run into the tens of thousands of dollars, quite apart from the costs of any corrective action required. Such fines impact the installation's budget. Enforcement actions can also be accompanied by criminal sanctions, although such actions are seldom taken under the CAA.

### Potential Sources of Violations

Violations can be issued for any failure to comply with a regulation. These failures may occur in control operations, in monitoring and sampling practices, or in administrative requirements. Figure 1-1 identifies several potential problem areas in a typical air pollution scenario.

### POLLUTION CONTROL OPERATIONS

Failures in pollution control may be of two types: actual emission violations and "administrative" violations that do not necessarily cause emission problems.

Sometimes, pollution control devices become obsolete as a result of long-term degradation or as a result of changes in a regulatory standard. Upgrading these devices requires significant capital expense. However, it is usually easily foreseeable; not many EAs have been issued because installed equipment is unable to achieve the level of control required.

Even where the control devices are properly designed, excessive emissions can occur. Pollution control devices are neither 100 percent efficient, nor are they infallible. Heavy process loads can present the control devices with a volume that cannot be handled effectively and excessive emissions are released to the environment.

Releases may also be caused by the temporary failure of the control system or as a result of malfunction or progressive deterioration. Those failures are often detectable only by monitoring (using continuous emission monitors or stack discharge monitoring).

Administrative violations may be issued for using improperly trained or certified operators on the job, failure to perform required actions such as inspections, failure to perform required maintenance and sampling, and failure to maintain required records. None of these failures necessarily result in pollution, but they can serve as early warning that the protective measures envisioned by the regulation are not being taken.

#### MONITORING AND SAMPLING ERRORS

Whenever a complex and detailed process is required, the potential for error arises. Samples may be taken at the wrong times, in the wrong way, or in the wrong places. Where technical support is required, samples may be improperly handled en route to the laboratory, or they may be mishandled by the laboratory, either in the testing protocols used or in the recording of the results. Often, the facility is held responsible for the failures of the laboratory, even where the only control exercised over the laboratory is through the contract payment process.

#### ADMINISTRATIVE OVERSIGHT

Managers are responsible to ensure that the program is executed as designed. The greatest evidence that this is not occurring is generally provided by the facility's own documentation, in the form of required plans and local procedures manuals that are either not on hand, not updated, or not complied with.

As noted earlier, numerous operating records must be maintained or submitted to regulators. In addition to required reports, facilities need to maintain records to show that required other records were submitted, required training and inspections were performed, and required control devices were ordered or requested. Permits must be on hand and current. Copies of required certifications must be available and current, and each regulatory agency will have additional required documents. Failure to meet administrative requirements is a major reason for EA issuance and is often cited by regulators since such deficiencies require limited on-site inspection and technical judgment, and they are not arguable.

## REPORT OVERVIEW

This chapter has described briefly what is being regulated under the CAA and how failures may occur. The remainder of this report reviews the Army's history of violations and analyzes specific cases to determine whether systemic corrective action is needed. Chapter 2 reviews the Army's historical data. Chapters 3 and 4 consider the results of a special data-gathering effort that was conducted to supplement the available data. Chapter 5 provides an overview of the possible future directions and implications of pending changes to the regulatory system under the CAA. Chapter 6 provides our conclusions and recommendations for an Army corrective action program.



## CHAPTER 2

# Historical Data About Air Regulation Violations

## OVERVIEW

### Enforcement Action

The number of EAs received is used by many activities within and outside the government as the primary measure of the status of the Army's environmental program. While concern over the receipt of these legal citations is rightly a matter of concern, it is unfortunate in that it does not recognize the success of the majority of Army activities in remaining in compliance with the many provisions of the ever-increasing number and complexity of environmental laws. Unfortunately, compliance can be measured only by the absence of noncompliance.

In general, EAs result from violations, either administrative or emissions-based, discovered during regulatory inspections. The inspections are prompted by regulatory schedule, increased regulatory emphasis in an area, as a result of citizen complaints, or as a result of reports filed by the installation or supporting activities. Normally, an installation's environmental staff is informed of the violation by the inspectors during the visit. This is confirmed subsequently in a letter of concern or by the formal issuance of an EA by the regulatory agency (county, state or Federal). Many times, one EA will contain multiple citations for a variety of specified deficiencies. The EA is a legal citation and is therefore subject to legal review by both the issuing activity and the installation. If the EA is not contested, corrective action must be completed within specified times, normally 30 to 90 days. Corrective action plans are often negotiated with the time lines extended to allow full compliance. Reinspections are normally performed to verify compliance.

### Environmental Data Collection Mechanisms

The Army has been collecting data to keep track of environmental compliance issues for many years. From 1984 to 1989/1990, the Army used the DESR system to record data that were collected annually and used in the evaluation of compliance status. The DESR system was replaced in 1991 by the Defense Environmental Management Information System (DEMIS). This system is more comprehensive and designed to provide environmental management leaders with the tools needed to make well-informed decisions regarding environmental compliance issues. Within the Army, the DEMIS is implemented through a much

more comprehensive information system called the Army Compliance Tracking System (ACTS).

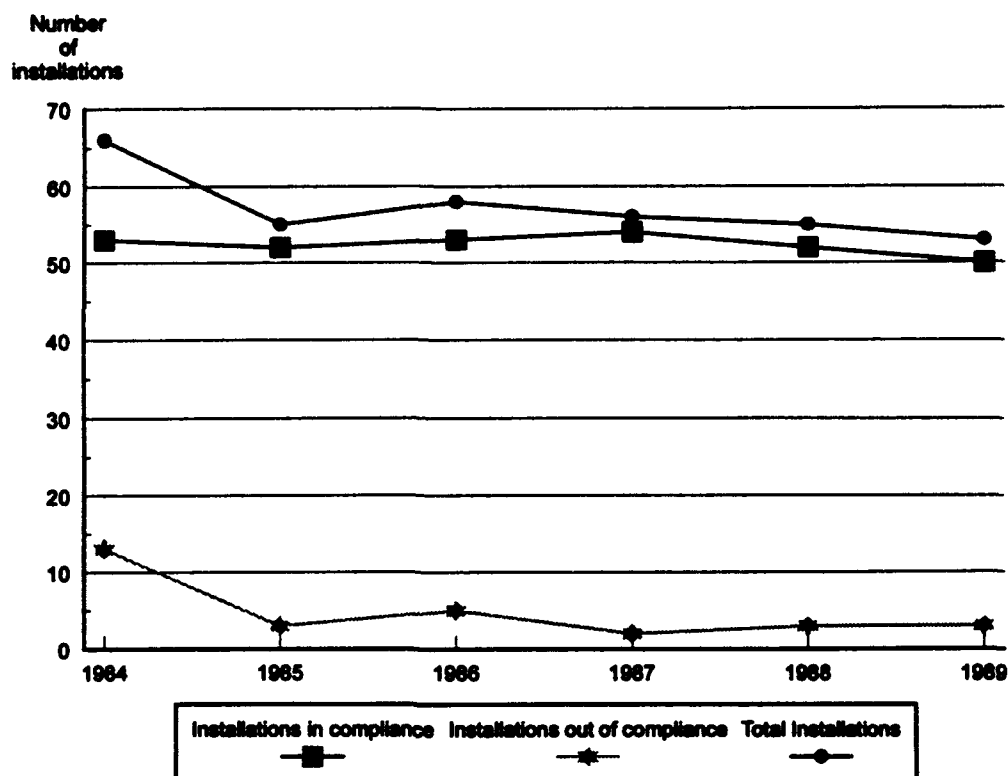
One of the biggest problems with the available data is that there is little baseline information. The data collection system only addresses CAA issues in general terms of violations and permits; data on the numbers and types of air emissions and control facilities are limited. Appendix A shows the data collection form; Appendix B summarizes all the data collected at the Army level and then provides a breakout by major command (MACOM).

Because the submission of DESR data was not stringently managed, the data contained in DESR tend to be inconsistent, but it does provide some insight into the Army's program during the past 8 years. This chapter is based on the DESR data set that was available. As of the time of this report, only 1 year of ACTS data were available, and because of first-year training difficulties, the data set was not robust enough to use to draw any conclusions.

Historical data from the DESR have not been fully linked to the ACTS. Although the best use of the historical data is in the analysis of trends, the changes in the details and types of data recorded in each system make it difficult to assemble and interpret historical records. More recent EA data from 1991 to the present, derived from case-by-case research, are presented in Chapter 3, where we provide an analysis of the specific EAs on file at the U.S. Army Environmental Center (USAEC) for the past 3 years. In Chapter 4, we examine those EAs in more depth based on interviews conducted with installation personnel.

## **HISTORICAL DATA ANALYSIS: AIR POLLUTION ABATEMENT PROGRAM**

Figure 2-1 shows compliance rates for Army installations, as captured by DESR. Since 1986, the count of installations with major air emission sources has remained generally constant, as might be expected. After the first year, the number of installations with sources out of compliance declined to a small two to five annually. One of the failings of the DESR format (shown in Appendix A) is that after MACOM aggregation, some data cannot be recovered (such as the number of installations with minor sources, or whether the three noncompliers are always the same installations).

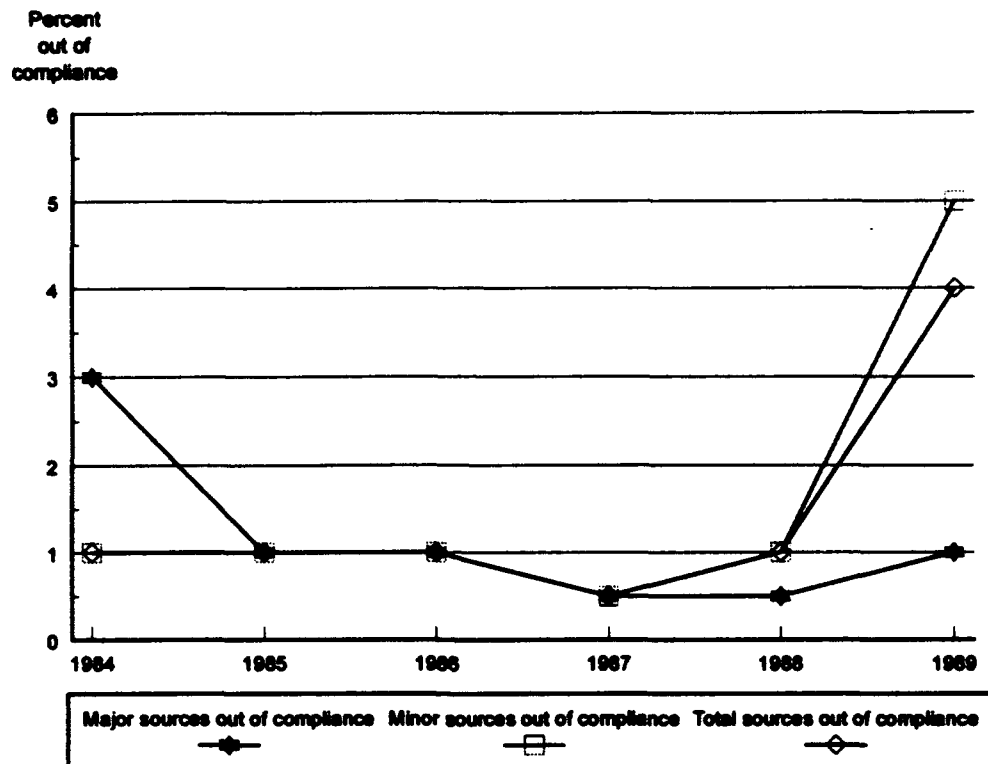


Installation compliance	1984	1985	1986	1987	1988	1989
Installations in compliance	53	52	53	54	52	50
Installations out of compliance	13	3	5	2	3	3
Total installations	66	55	58	56	55	53

**Figure 2-1.**  
**Army Compliance Status as of 1989**  
**(Installations with Major Air Emission Sources)**

The figures are even more impressive when considering the total number of sources that are operating (see Figure 2-2). Why that number fluctuates so significantly, especially among the major sources, cannot be determined from the data, which leaves some doubt as to their accuracy. Also interesting, but not subject to analysis from the data, is reason for the sudden jump in minor source noncompliance in 1989.

From 1984 to 1989, the Army's Air Pollution Abatement Program ranked third in the number of EAs received at Army installations behind the Wastewater and Hazardous Waste Programs. Army-wide, 114 EAs were received during the period; an additional 11 were still unresolved from earlier years. Twenty-one of these EAs remained unresolved at the end of the period covered.



Emission sources	1984	1985	1986	1987	1988	1989
Major sources	399	499	422	439	470	377
Out of compliance	13	3	5	2	3	3
Minor sources	1,473	1,450	1,605	1,919	1,750	2,090
Out of compliance	10	21	14	11	19	98
Total sources	1,872	1,949	2,027	2,358	2,220	2,467
Out of compliance	23	24	19	13	22	99

**Figure 2-2.**  
*Army Compliance Status by Source*

Table 2-1 summarizes the number of air pollution EAs recorded between 1984 and 1989.<sup>1</sup> DESR considered EAs in terms of the actions required for their resolution: those requiring administrative or operational changes and those requiring "abatement" (i.e., capital spending). Although the data show that a large majority (nearly 75 percent) of all EAs could be corrected without capital abatement projects, the DESR data do not provide any information on why each of the EAs was received. Information on the exact deficiency and an evaluation of the

<sup>1</sup>Comparing the calculated "Ending balance" with the reported data indicates that the data do not cycle accurately from year to year. Continuing inaccuracies of this nature led the DESR data to be considered questionable and led to its ultimate replacement.

**Table 2-1.**  
***Analysis of Clean Air Act Enforcement Actions (1984 through 1989)***

EA status	1984	1985	1986	1987	1988	1989
EAs start of period	11	19	16	13	12	18
EAs received	16	21	22	26	19	25
EAs requiring administrative/ operational changes	11	37	31	27	22	28
EAs requiring abatement (capital)	0	15	8	12	9	15
Total EAs	27	40	38	39	31	43
EAs resolved	9	13	13	23	14	22
Ending balance	18	27	25	16	17	21

underlying cause of the deficiency are essential to understanding why EAs are occurring and what programmatic changes can be made to resolve all EAs of a particular type.

Again, the existence of a large number of EAs should not obscure the reality that the overall compliance status of the Army's air pollution sources has been very good. Figure 2-2 illustrates the Army's historical accomplishment in this area: considering compliance of *all* sources, less than 1 percent were out of compliance during this 6-year period. Compliance for major sources (those sources that emit more than 100 tons per year of any of the primary pollutants — generally heating plants and incinerators) was exceptional. The percentage of major sources out of compliance remained generally at or below 1 percent during this period: Stated another way, the Army achieved a 99 percent compliance rate during the 6-year period.

One of the drawbacks of using percentile data is that it obscures growth of the total number of sources. The number of sources regulated increased 30 percent during the period. Although the compliance rate remained the same, the total number of air pollution sources out of compliance increased, as did the number of EAs requiring capital funding for resolution. This required an increase in the amount of funding needed to resolve compliance problems.

These trends occurred for several interrelated reasons: Air pollution regulations have become more stringent over time. As envisioned by the CAA, states have tightened permit limits and included operating procedure requirements in their standards. During the past decade, state regulatory agencies have placed greater emphasis on meeting air quality standards. With stricter enforcement, occasional noncompliance will be detected more often at marginal facilities. At the same time, as facilities age, they deteriorate, thus making it more likely that they will be unable to meet current standards consistently; and as their baseline technology becomes more dated, larger investments are required to ensure that

the facilities will be able to meet the more stringent standards at the time of permit renewal. These trends are likely to continue to increase because the CAAA-90 provisions regulate many more sources under standards and permit conditions that are far more demanding than those enforced during the previous decade.

## HISTORICAL DB 1383 PROJECTS IN THE AIR POLLUTION PROGRAM OVERVIEW

Data presented in this section were obtained from the DB 1383 data base. [This data base is so named because it is authorized for data collection under Reports Control System number 1383.] The data base contains several distinct project categories (shown in Table 2-2) that are related to air pollution abatement projects.

**Table 2-2.**  
***DB 1383 Report Pollutant Categories***

Category	Code	General content
National Ambient Air Quality Standards		
Point Source Control	NAQP	NAAQS
State Implementation Plans	SIPS	NAAQS
Control of Volatile Organic Compounds (VOCs)	CVOC	VOCs
Permits (fees, applications, and preparation and modification costs)	PRMT	Permits
National Emission Standards for Hazardous Air Pollutants	NEHP	HAPs
Control of Toxic Air Pollutants	CTAP	HAPs
Training	TRNG	Training
Asbestos	ASBS	Asbestos
Radon	RADN	Radon
Pollution Prevention	POLP	Miscellaneous

Besides the fact that the numbers of EAs issued are increasing, there are several reasons for the increase in all categories of air-related DB 1383 project submittals between 1988 and 1992. The DB 1383 process was fairly new in 1988, and not all installations had achieved complete participation in this project identification process — which links closely with project funding. As time passed, and as the competition for environmental funding intensified, installations realized that such funding could only be obtained through the DB 1383 system, and they began entering more projects. At the same time, air pollution laws, especially those enforced by states, were becoming much more stringent in general; states began to enforce emission standards for volatile organic compounds (VOCs) and other hazardous air pollutants not previously controlled. Finally, state enforcement

programs began to mature and receive much more emphasis than in previous years.

The DB 1383 data base was reviewed to determine the funding requested for air pollution abatement projects (including all those types of project categories shown in Table 2-2). Table 2-3 presents funding information for 1988 through 1992.

**Table 2-3.**  
***DB 1383 Records for Clean Air Projects (1988 through 1992)***

Fiscal year	Number of projects entered	Estimated total cost (\$ thousands)	Projects started	Funds obligated (\$ thousands)
1988	16	5,941	8	2,508
1989	251	48,261	115	13,326
1990	487	104,572	174	25,451
1991	723	191,871	304	56,158
1992	1,048	217,765	518	86,423
Totals	2,525	568,410	1,119	183,866

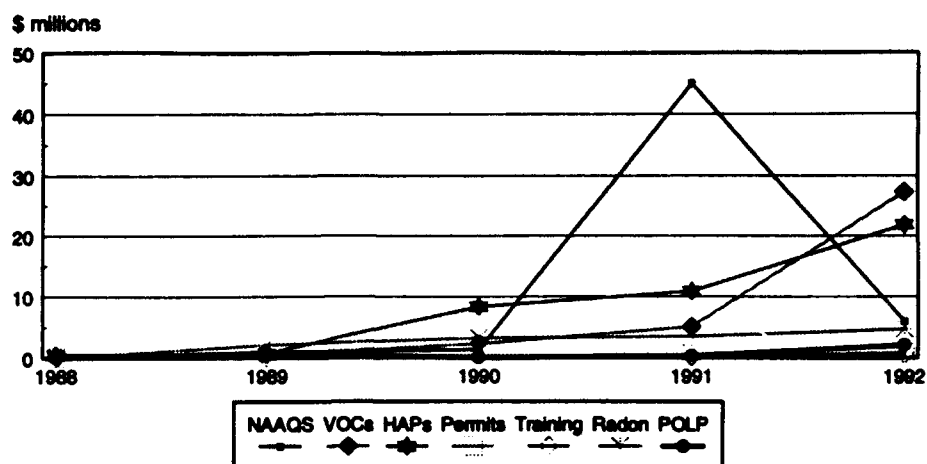
Source: 1383 data base, June 1993.

Assessment of the cause of this increase in funding (which can be expected to continue in later years given that this data set includes only the entries made through early in 1992) can be accomplished through a review of the funding requests for each of the project subcategories. That history is shown in Figure 2-3.

Each year, many more requests were received for a much wider range of projects. While some project types appear to have begun and leveled off, the vast majority of air pollution abatement funding (and its continuing increase) from 1988 through 1992 results from asbestos-abatement projects. This is clear from Table 2-4 but is also evident from Figure 2-4.

## ASBESTOS ABATEMENT PROJECTS

It is important to note that asbestos removal is generally not initiated as a result of a violation of the CAA or associated permits. Rather, asbestos removal projects are conducted either in conjunction with major rehabilitation work under conventional military construction projects or as a result of the Asbestos in Schools regulations. However, because regulators were slow to accept encapsulation rather than removal as the most appropriate treatment for asbestos-containing materials, removal was considered to be the control method of choice.



	1988	1989	1990	1991	1992
NAAQS	\$ 0.10	\$ 0.97	\$1.00	\$45.00	\$6.00
VOCs	0.00	0.46	2.29	5.04	27.34
HAPs	0.47	0.76	8.35	10.87	21.90
Permits	0.00	0.30	0.38	0.47	0.88
Training	0.00	0.02	0.26	0.26	0.65
Radon	0.00	2.12	3.21	3.50	4.73
POLP	\$ 0.00	\$ 0.66	\$0.00	\$0.31	\$2.08

Source: DB 1383, February 1993 submittal.

**Figure 2-3.**  
**Non-Asbestos Projects Required for CAA Compliance**  
*(thousands of dollars)*

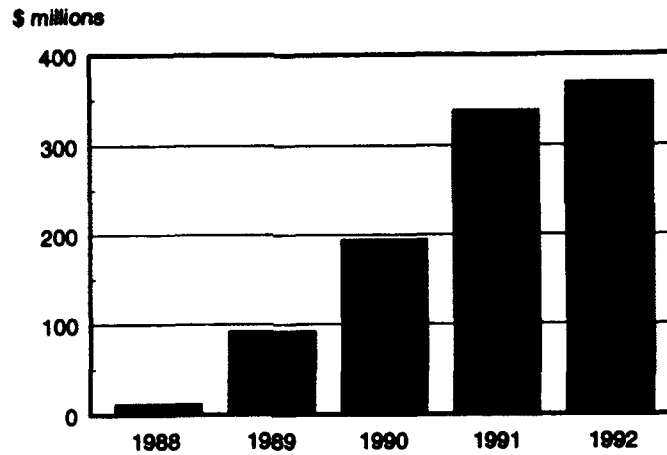
**Table 2-4.**  
**Asbestos Projects Within the Army's Air Compliance Program**  
*(1988 through 1992)*

Project type	Number of projects	Cost of projects (\$ millions)
<b>Class I</b>		
Asbestos	254	93.5
All projects	496	162.7
<b>All classes</b>		
Asbestos	1,161	999.7
All projects	2,458	1,734.7

Source: 1383 data base, June 1993.

Note: Class I projects are those that require funding to address current non-compliance situations.





Projects	1988	1989	1990	1991	1992
Asbestos projects	\$5.4	\$43.0	\$88.7	126.3	\$156.2
All other projects	5.9	48.3	104.6	211.1	211.8
Total projects	\$11.3	\$91.3	\$193.3	337.4	\$368.0

Source: DB 1383, February 1993 submittal.

**Figure 2-4.**  
*Projects Required for CAA Compliance*  
*(millions of dollars)*

## CONCLUSION

The Army's priorities are not misplaced, even though most project funding clearly did not go to EA corrective actions. It illustrates our earlier point: The focus on EAs ignores the very large investments the Army routinely makes to stay in compliance with the whole spectrum of environmental regulations; EAs are, in fact, a very small (if important and visible) part of the overall compliance program.

## CHAPTER 3

# Current Data About Air Regulation Violations

The existing data in the DESR provide some summation of EAs. The increases in those EAs can be accounted for to some extent by increases in both the scope and stringency of the regulatory effort. However, data shed little light on the specifics of why EAs continue to be received well after regulations go into effect. To understand this more fully, it was necessary to examine the EAs themselves.

## DATA USED FOR ANALYSIS

The USAEC is responsible for the collection and management of environmental data within the Army. Reflecting the Army's increased emphasis since 1991 on reducing the incidence of EAs, installations have since 1991 been required to forward copies of FAs to USAEC within 48 hours of receipt. Although the system took a little time to mature, USAEC files now include copies of most of the EAs from the installations since the start of FY90. The data from these EAs provide the most current and accurate information available for analysis.

The Army's primary environmental data system is the ACTS. EA information is entered into ACTS from installations as events occur; in addition, USAEC reviews its records periodically and updates EA information that has not been captured by installations. In earlier reports on EA analyses,<sup>1</sup> LMI had to obtain this information by physical review of the paper files; now that the data are being captured through ACTS, we could use ACTS data for this report.

As originally configured, and until current test releases of the ACTS software are fielded formally, ACTS does not provide an automated way of aggregating EAs except as a total count by media program or major command. Aggregated EA information for the air program is shown in Table 3-1.

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<sup>1</sup> LMI Report CE211R1, *Reducing Notices of Violation – Citations Received Under the Safe Drinking Water Act*, Douglas M. Brown, Linda McConnell, and Sonny Oh, July 1993.

LMI Report CE211R2, *An Achievable Compliance Goal: Eliminating Notices of Violation Issued to the Army Under the Toxic Substances Control Act*, Douglas M. Brown, October 1993.

LMI Report CE211R3, *Planning and Management Failures Cause Clean Water Act Violations*, Douglas M. Brown, and Robert J. Baxter, September 1993.

**Table 3-1.**  
**EA Data for the Major Commands**

Major command	Total EAs	Percent of EAs
Army Materiel Command	32	20%
Training and Doctrine Command	32	20
Forces Command	73	45
National Guard Bureau	20	12
Other	6	3
Total	163	100%

Recent modifications to the ACTS included the addition of "reason codes" and corrective action codes for EAs. These codes were developed in an earlier LMI study<sup>2</sup> that reviewed over 2,100 environmental violations contained in the copies of the EAs that were on file at the USAEC. Regulators describe similar findings in many ways and if these findings are not coded into a consistent system, the information cannot be interpreted easily without reading the details of every finding. A detailed breakdown of the EA reason codes is provided in Appendix D.

The EAs resulting from failure to meet the CAA standards were reviewed for the period November 1990 through January 1993. Very few EAs were in the ACTS data base for that period. The system was placed in service in late 1990 and was not fully used by installation personnel until mid-1991. Therefore, data from 1990 and 1991 are somewhat limited. Additionally, only a limited amount of data from 1993 had been entered into the system by the time this report was prepared. For the data in Table 3-2, the distribution of EAs by reason code was concentrated in the years 1991 (25 percent) and 1992 (47 percent).

## PRIMARY CAUSES OF EAS

The data in Table 3-2 indicate that the majority of the violations result from "administrative" or operational deficiencies. EAs in ACTS reason codes 20, 30, 40, 70, and 80 are considered to be administrative or operational in nature. This indicates the facility was capable of meeting the technical standards necessary to preclude excessive emissions, but some error resulted in a condition of noncompliance. Conversely, EAs in reason codes 50 and 60 are associated with capital expenditures needed to correct compliance deficiencies and are classified as "abatement" EAs.

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<sup>2</sup>LMI Report AR202RD4, *Deriving Management Information from Environmental Notices of Violation*, Douglas M. Brown, H. Locke Hassrick, and Robert J. Baxter, October 1992.

**Table 3-2.**  
**EAs by Reason Code**  
**(November 1990 through January 1993)**

Reason code	Definition	Total EAs	Asbestos EAs	Percent
10	Exceedances (permit limits)	23	0	14%
20	Technical work	4	1	2
30	Personnel issues	3	2	2
40	Operational deficiency	100	50	61
50	Spills/leaks/discharges	3	1	2
60	Facilities problems	14	0	9
70	General management	11	1	7
80	Legal agreements	5	4	3
Total EAs		163	59	100%

*Note:* The EAs related to asbestos are listed separately because these EAs have traditionally been viewed as a separate category of violations. The EAs for asbestos violations are discussed separately in the report.

Where the EA is issued simply for an "exceedance," it is not possible to determine whether the problem was an operator error, a maintenance failure, or occurred at a facility that is simply unable to perform the required control function. Therefore, we have considered them separately in the following discussion.

For air sources, the proximity of the source to the environment almost ensures that operational failures will result in releases of pollutants to the environment. Thus, we cannot say that in 75 percent of the cases there was no pollution just because the violations were administrative or operational. Another way to consider the data is that more than one-half of the violation citations were for operational deficiencies and an additional quarter were for actual emissions. Determining the impact of the operational violations, however, requires a case-by-case review.

## ASBESTOS EAs

A total of 59 of the EAs (36 percent) were issued for violations of the asbestos NESHAP. All the asbestos violations fall into the general category of administrative or operational violations, given that the single asbestos EA coded as reason code 50 (spills/leaks/discharges) should probably have been coded as a 40, because the specific violation was improper disposal of asbestos.

# ADMINISTRATIVE AND PROCEDURAL EAs

## Overview

Installation staffs often argue that inadequate funding for capital facilities is hampering their compliance efforts. However, the majority of EAs, 75 percent, are due to sampling, recordkeeping, and similar administrative or procedural errors that can be corrected at the installation level with limited additional funding. Making the corrections simply requires more effective initial training and continuing supervision. More than 100 such EAs are on record, and in reality numerous others (such as excessive emissions and spills) can be attributed to the same lack of training or supervision or operational errors. This proportion is very similar to that reflected by the DESR data.

The main cause for administrative EAs is largely that installation environmental staff members and others performing activities that affect air pollutant emissions do not know all the procedural regulatory requirements. This lack of knowledge may result from a lack of initial or update training, from inexperience, or from overburdened staff members being unable to provide adequate attention to detail. Which of these explanations is correct can only be determined by deeper research into each case, as is done in the Chapter 4.

Administrative EAs are relatively easy to resolve once the environmental and/or operating staff learns about the deficiencies. One-time "resolution" of a specific violation is not the same as fixing the underlying systemic problem(s) that will likely cause that violation to recur; the data base makes clear that recurring violations are not uncommon.

## Inadequate Facilities

Fourteen (9 percent of all EAs) violations were issued for inadequate or improperly maintained capital facilities. This relatively small proportion may be significant and may be understated because emissions are often the result of deteriorating or obsolete equipment. Even if an installation has old pollution-control systems, the equipment still must perform up to standard. While that equipment may not meet new standards when a permit is being renewed, in the interim it must perform at least as well as was required when it was installed.

If installations have a proactive preventive maintenance and capital upgrade program, most of these EAs can be avoided. Plant supervisors have the primary responsibility for proper operations and maintenance of the treatment systems, but environmental coordinators have primary responsibility for forecasting the need for outyear funding. Detailed coordination between the facility managers — often the Directorate of Public Works — and environmental staffs is needed to develop an effective funding plan.

It is an appealing shortcut for plant supervisors to reduce preventive maintenance when there is a shortage of available resources. It takes a long time before the lack of preventive maintenance causes the system to deteriorate to a point where it becomes a major problem. However, when the major problem occurs it normally requires a very extensive capital investment. Environmental staff and plant supervisors must periodically inspect the systems to ensure that proper maintenance is conducted.

## Exceeding Permit Limits

Fourteen percent (23) of the EAs were received for exceeding permit limits. These exceedances do result in the release of unauthorized levels of contaminants and over time can have a serious impact on human health.

As a rule, permit limit exceedances do not occur by themselves. They are caused by an accompanying failure that was not (and often could not be) documented by the regulator. These reasons include operator error, equipment failure, sampling error, and in fact all of the other reasons why an EA might be issued. Since DESR and the EA data base do not provide sufficient information to determine the causes of these EAs, more probing interviews were needed to determine the cause.

## CONCLUSIONS FROM THE EA DATA BASE

The systemic problems identified in the analyses of the data include

- ◆ lack of knowledge on the part of installation staffs, leading to procedural or operating errors;
- ◆ general management failures whereby individual incidents of lack of training or adherence to established requirements are sufficiently pervasive that they indicate a lack of management awareness or attention; and
- ◆ lack of maintenance, or lack of forward-funding for capital projects needed for aging plants or to upgrade facilities to meet new regulatory requirements.

The data base provides only the specific symptom identified by the regulator. We have had to add the real reason for the EA. Our conclusions from the data base are plausible but are based only on speculation supported by our experience. The documents that make up the EA data base are diverse (and often vague) enough that it is impossible to derive detailed conclusions from them. Judgment was used in applying "reason" codes to the EA records. The data base allows us to see that most of the EAs result from procedural violations; these are by definition the result of operator or supervisory failure. The data that we have provided here clearly suggest that some systemic problems exist. However, to propose solutions for these problems requires a more detailed understanding of

*why* those failures occur so that specific and appropriate solutions may be devised. To do otherwise would result in the proposal of solutions that not only fail to address the true problems, but would consume time and resources, further detracting from the installation staff members' efforts to manage their programs.

To validate these assumptions, we reviewed the specific situations surrounding the EAs that were issued. We conducted interviews with installation personnel to extend our knowledge of the situation and validate the apparent problems. The results of those interviews are discussed in the next chapter.

## CHAPTER 4

# Causes of Enforcement Actions

Because of the large number of EAs (163) issued during the past 5 years, we did not call every installation that received an EA to obtain an explanation of the circumstances. Instead, we identified the types of EAs most frequently issued and conducted interviews with staff members from 22 installations (which together received 55 of the EAs). Table 4-1 summarizes the general causes of the EAs issued to the 22 installations. Appendix C describes the circumstances surrounding each EA and the root causes for those violations.

## ROOT CAUSES OF EAs

After evaluating the EAs, we identified eight general root causes for receiving the EA citations. Those root causes are as follows: contract problem; lack of resources/funding; lack of environmental knowledge; lack of management attention/poor supervision; equipment failure/obsolescence; regulator error/confusion; lack of a technical solution; and miscellaneous reasons. Each root cause is discussed below. These root causes are the same as those identified for other compliance programs in our earlier reports. Notice that these causes are the underlying reasons for the condition (symptom) that is itself written up in an EA. Thus, failure to submit a report is a symptom; lack of knowledge that the report was required may be the cause.

### Contract Problem

Violations involving contractors include cases where the contractors failed to perform tasks required by, or in the manner required by, a regulation. Contractor personnel may violate regulations intentionally, as a way to reduce personal effort or to cut costs, or inadvertently, because they are unaware of the requirements of the regulations. Sometimes, poor contract management prevents contractors from performing effectively or prevents corrective action from being taken when inadequate contractor performance occurs. Because installation anecdotes seldom concede poor contract oversight or inappropriate directives given to contractors as a cause, we have included all cases of contractor-related EAs in a single category.



**Table 4-1.**  
***Categorization of Causes of Environmental Actions, by Installation***

Installation	Root causes of EAs							
	C	F	K	M	O	R	T	Misc.
A	✓	✓	✓	✓		✓		✓
B		✓	✓	✓				
C	✓		✓	✓		✓		✓
D					✓		✓	
E			✓	✓		✓		
F			✓	✓	✓			
G	✓		✓					
H		✓	✓	✓	✓			✓
I	✓	✓	✓	✓				
J	✓		✓			✓		
K	✓		✓					
L			✓	✓				✓
M					✓			
N	✓		✓		✓	✓		
O					✓			
P								✓
Q		✓					✓	
R	✓		✓					
S	✓		✓		✓			
T	✓							
U		✓	✓					
V		✓	✓	✓				
Total	10	7	16	9	7	5	2	5

*Note:* C = contract problem; F = lack of resources/funding; K = lack of environmental knowledge; M = lack of management attention/poor supervision; O = equipment failure/obsolescence; R = regulator error or confusion; T = lack of a technical solution; and Misc. = miscellaneous causes.

## Lack of Resources/Funding

Air pollution prevention and reduction processes often require large and expensive capital facilities and adequate staffing. When the facilities become too old to run effectively, or when changing regulations force the installation to strive for a standard of air quality that the facility simply cannot achieve, an installation must make large investments to construct new facilities or to upgrade existing ones. On the other hand, in those cases where the failure to upgrade a facility occurs because decision-makers place a low priority on the funding of such projects, the underlying cause is classified as a management failure.

Because the old technology deteriorates gradually, it is difficult to tell when a piece of equipment will fail. If real-time monitoring equipment is not in place, the environmental personnel will learn that equipment is performing suboptimally only after a regulator draws an air sample that fails to meet standards, a situation that sometimes generates an automatic EA. Regulators frequently renew or issue new permits only on the condition that installations make changes to their facilities; failure to implement the changes results in EAs. Finally, inadequately staffed environmental offices do not have the resources to keep up with the requirements of the many programs that are initiated by Federal, state and local regulatory bodies — which in turn generates a lack of knowledge.

## **Lack of Environmental Knowledge**

The primary reasons for lack of knowledge within the environmental staff are limited experience coupled with inadequate initial or refresher training. Assigned personnel must have the requisite level of environmental knowledge. Candidates for training include not only an installation's environmental professionals but also an installation's shop workers and contractors (when applicable) because poorly trained individuals who operate systems capable of causing pollution sometimes take actions that result in violations.

## **Lack of Management Attention/Poor Supervision**

Individuals may create situations that lead to violations of the CAA because they lack knowledge, make occasional errors, or lack interest in their work. Whenever lack of knowledge or interest becomes pervasive, an individual's supervisor should correct the problem. Recurring violations are prime examples of supervisory failures. These may extend from having inadequate systems of quality control or feedback to failing to take the actions required to support the needs of the CAA program, particularly its financial needs. Violations may manifest themselves in technical ways that result from inadequate or delayed funding for corrective actions that upper management knows are necessary. This class of violations can also result when installation managers ignore regulatory pressures until the regulators issue an EA. Finally, lack of communication and coordination between different levels of management and among different types of managers may translate into EAs.

## **Equipment Failure/Obsolescence**

Inadequate maintenance and obsolescence cause most equipment failures. Inadequate maintenance may result from insufficient funding, from paying too little attention to requirements, or from the inevitable deterioration and breakdowns in facilities that are too complex to maintain proactively. Violations can also occur as a result of unexpected failure of equipment, even though the installation exercised proper preventive maintenance. Equipment-related violations due to operator error are considered to be a lack of environmental knowledge.

## Regulator Error/Confusion

Occasionally, regulators issue EAs in error. On other occasions, the installation may receive an EA because it took actions based on a regulator's incorrect advice or unwillingness to provide timely advice. In this category, we also address the more frequent cases in which an EA was issued when the regulator disagreed with the installation's interpretation of the intent or specific requirements of a regulation. Cases where installations chose not to execute clear regulatory guidance, however, are considered as supervisory failures or knowledge failures.

## Lack of a Technical Solution

Sometimes, violations occur and recur because there is no technical solution to a specific problem. In such cases, installation environmental personnel know that taking a certain action will result in an EA, but they are not in a position to terminate the operation that is creating the problem.

## Miscellaneous Causes

In addition to the main causes discussed above, we found miscellaneous instances of unique, unknown, or unsolvable causes. One such cause is simple human error, which can be controlled, but which will occur from time to time. Another "reason" cited by installation personnel is that, because of the length of time that has passed since the EA was issued and due to rapid staff turnover at an installation's environmental office, no information exists concerning the circumstances surrounding the receipt of the EA.

## ANALYSIS OF ROOT CAUSES OF EAS

Some of the causes of EAs occur more frequently than others. The differences are even more pronounced when we consider the specific findings within the EAs. The 22 installations received a total of 55 EAs. Table 4-2 lists the causes and the number of times each cause was cited. The total number adds up to more than 55 because some EAs had multiple causes. Because the minor or unique contributing causes are less widespread, they tend to cause a single EA at a single installation, which is then sensitized to the issue and the problem is solved. The major causes that the Army must address recur at installations from one citation to the next.

**Table 4-2.**  
**Frequency of Root Causes for Violations**

Cause	Code	Frequency of root causes cited
Contract problem	C	14
Lack of resources/funding	F	12
Lack of environmental knowledge	K	27
Lack of management attention/poor supervision	M	16
Equipment failure/obsolescence	O	10
Regulator error or confusion	R	6
Lack of a technical solution	T	3
Miscellaneous causes	Misc.	6
Total	—	94

*Note:* Total exceeds 55 EAs because some EAs had multiple causes.

## LACK OF ENVIRONMENTAL KNOWLEDGE

Lack of environmental knowledge, inexperience, and insufficient training at the installation level comprise the dominant underlying cause of EAs. Aside from errors of omission by environmental staff members, compliance with the CAA depends on supporting contractors, soldiers, and civilians across the installation who must know how to deal with various air pollution sources. The interviewees indicated that most EAs were resolved quickly after regulators pointed out the violations.

The many lack-of-knowledge-related EAs in the data base and the similar proportion shown in the DESR are supported by the case studies. Lack of environmental knowledge was most frequently cited at the EA finding level (see Table 4-2), and 16 of the 22 installations in the sample reported lack of knowledge as a cause of EA receipt (see Table 4-1).

A distinction exists between one-time resolution of a specific type of EA and the permanent elimination of that type of violation. The interviewees were universally of the opinion that environmental staff members are overburdened and fail to keep track of minor regulatory changes since they are too busy dealing with compliance issues in other regulatory programs. Furthermore, because of the continuing rotation of soldiers from one installation to another, as well as between assignments at a single installation, lessons at the operator and unit levels must often be relearned. As a result, "resolved" EAs can and do recur for the same compliance failure.

## LACK OF MANAGEMENT ATTENTION

The second leading cause of EAs is lack of management attention: nearly half of the installations (10 of 22) reported lack of management attention or supervision as an underlying cause of EAs. In general, lack of management attention and poor supervision problems were quickly resolved when installations received an EA. In many cases, supervision problems can be resolved with the institution of quality control checks once managers and supervisors become aware that something must be checked. However, where EAs resulted from a lack of communication, coordination, and cooperation between managers, the problem seemed more entrenched, and interviewees expressed their frustration in searching for a solution.

## CONTRACTOR PROBLEM

Lack of management supervision and oversight is closely related to problems involving contractor operations, the third most frequent cause of EAs. At some facilities, responsibility for daily operations belongs not to the environmental staff of the Army installation but to a private entity or to another governmental or military body. However, the installation's environmental office staff must play a regulatory oversight role. For instance, under the CAA, contractors have significant regulatory compliance roles, especially in asbestos abatement, and they must be aware of their responsibilities. Nonetheless, environmental staff members cannot afford to wait until an EA is issued before taking a closer look at the contractor's operations. Assuming that a contractor knows about, and will comply with, all applicable regulations has often proven to be a serious mistake.

## LACK OF RESOURCES/FUNDING

Failure to obtain necessary funding for critically deficient facilities or needed maintenance reflects, in the end, a lack of management attention to the air pollution control program. If a project is not requested, then this failure is on the part of the environmental staff at the installation; if it is requested but not approved, it is a failure of that staff to justify the need effectively, combined with a failure of the chain of command to exercise effective concern for the requirements.

## MULTIPLE UNDERLYING CAUSES OF EAs

Under the CAA, more often than not, EAs have multiple underlying causes. This distinguishes the CAA from other programs, such as the Clean Water Act, where EAs generally have only one underlying cause. In our sample, the number of EAs with multiple causes was 32 of 55, or 58 percent. Excluding the EAs

whose underlying causes are unknown increases the percentage of EAs with multiple causes to 63 percent.

Upon further analysis of the case histories, a strong interrelationship emerges among the four most prevalent causes of EAs: lack of environmental knowledge, lack of management attention or poor supervision, contract problems, and lack of resources or funding. Installation personnel frequently cited these reasons together. Moreover, the four most prevalent reasons for EAs tend to overlap and feed on each other, escalating the problems that lead to EAs. For example, a contract problem may arise when the contractor does not have the requisite knowledge (or inclination) to perform a task correctly. Action officers often do not possess the technical knowledge needed to provide adequate oversight. More experienced managers are overworked and do not have the time to provide the oversight. The contractor continues to perform inadequately and the problem remains unknown until the installation receives an EA.

Furthermore, the causes and effects of the different reasons are not always clear, posing a chicken-or-egg problem in determining which cause forms a basis for the others. For instance, when an installation does not have sufficient funding to train its personnel, the personnel lack the environmental knowledge necessary to perform their jobs in accordance with regulations. As a result, the installation receives an EA. The same situation may be viewed alternatively: The personnel do not have the knowledge to realize that they require training and fail to obtain the necessary funding. No matter how the situation is characterized, the result is the same: the receipt of an EA.

Because of the interrelationships among the causes underlying EAs, managers must take a coordinated approach in implementing solutions. Solutions requiring investments in training of lower level staff and managers, combined with the strain on Army budgets that can be expected in the next few years, are going to place managers in a difficult position. Avoiding major EAs will require action to be taken when minor violations first start indicating future problems; yet, funding for what appear to be problem-free situations at the time (or deferrable problems) will take place at the expense of other activities. Review of the case studies supports the assessments derived from the EA data base (provided in Chapter 3). There, we supposed that the primary problems included lack of staff knowledge, lack of supervisory attention, and the lack of adequate facilities — which often ties to a lack of adequate funding.

Various solutions can be developed to address the problems identified so far. By targeting a specific problem with a coordinated solution, the systemic inadequacies can be addressed to eliminate further EAs. This study does not address specific solutions to avoid specific violations. However, in Chapter 6, we do provide some specific programmatic recommendations that address the major and most consistent deficiencies. Implementation of those recommendations should improve the overall program and result in the elimination of a significant portion of the EAs.

## ADMINISTRATIVE ENFORCEMENT ACTIONS

Approximately one-half of the violations (28 of 55 EAs or 51 percent) do not directly cause pollution. They can be classified as administrative EAs. These EAs are largely caused by environmental staff members' failure to know the procedural regulatory requirements. (Some of the other violations that resulted in pollution could have been avoided if more experienced operators were able to identify the warning signs in the monitoring data, or if facility designers and managers were more conversant with the regulations. These are also procedural or regulatory knowledge issues.)

Lack of knowledge may result from inexperienced or overburdened staff members who must deal with increasingly complex regulatory requirements. Even the most experienced environmental staff members can be caught off guard because the regulations are constantly changing and are difficult to understand.

In general, administrative EAs are incidental in nature (in that regulatory requirements simply had been overlooked). Those violations do not pose a serious threat to human health. However, those violations create an unfavorable image of the Army by implying that installation-level environmental professionals do not have adequate concern for the health risks associated with violations of the CAA. They create the appearance of impropriety. More importantly, administrative EAs potentially can lead to actual pollution incidents that may have a serious impact on human health if they persist. To avoid administrative EAs, the most practical solution has been to hire fully qualified environmental professionals in adequate numbers to monitor CAA compliance.

Administrative EAs are relatively easy to resolve once the environmental staff and the operators learn about the deficiencies. All installations cited have taken corrective measures very soon after deficiencies were identified. Again, we must emphasize that one-time "resolution" of a specific violation is not the same as fixing the systemic problem that will cause the violation to recur.

Regulatory CAA requirements are constantly changing; it is very difficult to avoid receiving administrative EAs unless someone constantly keeps track of all applicable requirements for each installation and develops appropriate corrective actions. The implementation of the Environmental Compliance Assessment System (ECAS) auditing process<sup>1</sup> will help to identify deficiencies before regulatory inspections find them; but, because those audits are infrequent, installations must develop their own internal audit capabilities. To eliminate EAs stemming from a lack of regulatory knowledge, the Army must develop an extensive research capability to perform analyses of all CAA regulations (Federal, state, and local) to stay current on both the text and meaning of all regulatory requirements that apply to Army installations. Installation environmental staff must stay on top of regulatory changes and identify and implement appropriate corrective action. Some continuing training efforts need to be organized to inform the

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<sup>1</sup>ECAS is a process providing centrally funded facility audits conducted by teams of functional experts. It is an installation assistance visit rather than an external inspection.

installation-level environmental staff members about regulatory changes and how to take the appropriate proactive or corrective actions.

## EAs DUE TO INADEQUATE AIR TREATMENT FACILITIES

Because treated air is discharged directly into the atmosphere, EAs received as a result of equipment failure can have an impact on human health. This root cause is identified for nearly 20 percent of the EAs issued. In reality, the actual harm caused by release of pollutants into the atmosphere is generally minimal. Nonetheless, the Army must address the causes underlying these EAs. Such EAs arise from two causes: maintenance failures and inadequate facilities that cannot meet standards. (Notice that, in contrast to the data-based analysis in Chapter 3, through interviews we could remove from this category the cases where exceedances are caused by human error.)

### Maintenance Failures

Some installations have neglected the proper upkeep and maintenance of their air treatment facilities. Our study revealed that 5 percent of EAs resulted from inadequate maintenance procedures. If satisfactory preventive maintenance programs were in effect and implemented, most maintenance-oriented EAs could have been avoided. Supervisors have the primary responsibility for proper operations and maintenance of the treatment facilities.

It is an appealing shortcut for supervisors (or, more often, installation and MACOM managers and budget staff) to reduce preventive maintenance when there is a shortage of available resources. It takes a long time before the lack of preventive maintenance causes a system to deteriorate to a point where it becomes a major problem. However, when a major problem occurs, it normally requires a very extensive capital investment. Environmental staff members and plant supervisors must periodically inspect air treatment facilities and equipment to ensure that proper maintenance is performed.

### Inadequate Facilities

Many installation environmental managers are concerned about aging facilities and equipment. For instance, several violations can be attributed to simple obsolescence of the air filtration systems.

When more stringent or additional regulatory standards are proposed, usually as part of a permit renewal or new permitting requirement, they are normally followed by some confusion and controversy about how to meet the new standard. Army installations must review their systems and determine the measures that are required to satisfy new standards, both now and in the future. Although architectural and engineering and environmental firms are hired to



provide technical support, the Army must develop additional internal expertise to ensure that the corrective measures taken are both adequate and in the best interest of the Army.

Capital projects must be funded. Environmental managers sometimes experience difficulty in obtaining expeditious funding for air treatment facilities. This results partly from the confusion surrounding viable solutions, partly from a lack of any obvious health risks, and partly from the environmental staff members' failure to explain the need for facility upgrades in a convincing manner to decision-makers who must divert funds from other worthy programs. It may also occur because the installation staff does not get around to making an entry in the DB 1383 system.

## CONCLUSIONS REGARDING EAs

Army installations receive EAs for many reasons, principally inadequately trained staff members. Difficulties have been accompanied by stricter regulatory enforcement (including more frequent inspections as well as tougher interpretation of the regulations) and a demanding permitting process. Although increasingly stringent regulations are sometimes enacted to provide more regulatory control rather than any additional measure of pollution control, the Army must correct any deficiency to ensure full compliance.

Resolving EAs has been relatively simple for most of the installations: The impact on the Army's mission has been minimal to date. However, case studies reveal some systemic weaknesses within the Army's compliance programs. The major cause for EAs is that the Army does not have adequate environmental regulatory knowledge at the operating or supervisory level to ensure that all Army-owned treatment facilities are in compliance with the law.

Until the Army addresses its systemic problems, the installations will be forced to react to regulatory pressure in a piecemeal fashion, resolving EAs by the most expedient, though not necessarily the best, methods available.

## CHAPTER 5

# Future Compliance Challenges in Air Pollution Abatement

## DEALING WITH KNOWN REQUIREMENTS: PROJECT FUNDING

Air-related DB project funding submittals increased for several reasons between 1988 and 1992 (Table 5-1). The DB 1383 process was fairly new in 1988; some installations had not yet started participation in this project identification process, which links closely with project funding. As time passed, and as the competition for environmental funding intensified, installations realized that such funding could only be obtained through the DB 1383 system, and they began entering more projects. At the same time, air pollution laws, especially those enforced by states, were becoming much more stringent in general, and states began to enforce emission standards for VOCs and other hazardous air pollutants not previously regulated.

**Table 5-1.**  
*DB 1383 Projects for Air Pollution Abatement (1988 through 1993)*

Year	Projected cost (\$ millions)	Asbestos costs (\$ millions)	Asbestos as percentage of total
1988	5.9	5.4	92
1989	48.3	43.0	89
1990	104.6	88.7	85
1991	191.9	126.3	66
1992	217.8	156.2	72
1993	282.8	141.1	50

It is important to recognize that asbestos-abatement projects account for the majority of the air pollution abatement funding during this period (approximately 70 percent on the average). Certainly, asbestos-abatement projects are a major driver in the funding of the air pollution-abatement program, but it is unlikely that those projects will continue to dominate funding requests in this program area in the future. The majority of the asbestos-abatement projects have been completed or are scheduled for funding and completion in the near future. When the asbestos project costs are subtracted out of the system, the funding

received for the remaining air pollution-abatement categories has been relatively low.

The cost of compliance with new regulations – primarily the NAAQS, VOCs permit system, and hazardous air pollutants (HAPs) regulations – is increasing. This is not surprising because both the Federal government and state governments are enforcing stricter regulations in these areas. The costs of projects for permitting and training have remained relatively constant during this 4-year period. This is surprising because many states have adopted progressively more stringent permitting rules, higher permit fees and major permit fees, and procedures that require documented training.

Table 5-2 shows a decreasing trend in the project funds requested in all project categories. In fact, however, we may be looking at a limit to installations' ability or willingness to forecast continuing requirements. A more realistic expectation would be that the programs that appear to show a funding decline will level off at some quantity higher than current levels of expenditure as programs enter a mature maintenance phase. Again, that reflects only compliance under current regulations: All the current literature and knowledgeable air pollution abatement experts predict a sharp increase in the cost of compliance with the CAAA-90 and the state implementation of these regulations.

**Table 5-2.**  
*Emissions Control Projects Required for CAA Compliance*  
(thousands of dollars)

General content	1993	1994	1995	1996	1997
NAAQS	\$83.8	\$15.0	\$16.2	\$7.4	\$6.7
VOCs	16.4	11.2	14.8	11.3	4.4
HAPs	15.7	20.5	21.3	8.3	8.2
Permits	1.4	3.7	2.4	1.5	1.0
Training	0.7	0.4	0.4	0.4	0.4
Asbestos	141.3	146.3	97.4	72.6	58.2
Radon	4.6	4.0	4.9	3.2	1.4
POLP	18.5	27.3	48.1	27.0	25.8
Total	\$282.4	\$228.4	\$205.5	\$131.7	\$106.1

Source: DB 1383, February submittal.

The numbers and types of project requests submitted to the 1383 system should be reviewed carefully for the out years. Key program areas requiring extensive funding will include compliance with new hazardous air pollutants regulations, the permit system, and NAAQS. Additional funding will be required in training to stay abreast of the new regulatory requirements. It is important to fund the training early so that Army personnel will be aware of the regulatory requirements before they become effective. This should prevent some administrative EAs. These additional funding needs have been identified by the U.S.

Army Environmental Center (USAEC) air pollution program manager, and actions to enter these funding requirements into the process are underway.

One activity that should show overall decreases is asbestos-abatement projects, which should decrease markedly. However, projects to deal with new requirements for lead-based paint abatement are expected to begin appearing in the 1995 period (very few are in the present data base).

## DEALING WITH FUTURE REQUIREMENTS

The Clean Air Act Amendments of 1990 (CAAA-90) and their implementation by the various states are expected to create major compliance challenges for the Army (and all other regulated entities). Permitting provisions take effect starting in 1995. The major challenges lie in compliance with the NAAQS, the HAPs, and the permitting systems. Many estimates of the total cost of compliance with the new legislation have been made. *Chemical and Engineering News* estimated the cost of compliance to range from \$10 billion to \$11 billion per year by 1995 (when permitting provisions take effect) and between \$22 billion to \$50 billion per year by 2005, when most of the other provisions are fully implemented. The best estimate is that the cost of compliance will be on the order of \$25 billion per year by 2005. The Army, viewed as a major industry, will be faced with meeting its proportionate share of these compliance costs. The CAAA-90 are projected to be the most expensive environmental legislation ever enacted. One only needs to reflect on the cost of RCRA compliance and the Installation Restoration Program to develop an appreciation for the magnitude and cost of compliance with the CAAA-90.

## REGULATORY IMPACTS OF CAAA-90

### Title I. Attainment and Maintenance of the National Ambient Air Quality Standards

Appendix E presents a list of Army installations and the classification of the air quality region in which they are located with respect to ozone, carbon monoxide, and particulates (PM<sub>10</sub>).<sup>1</sup>

Army processes in ozone nonattainment areas will be subject to strict emission and offset limits for VOC emissions. These emission limits will certainly require implementation of controls on the following processes: fuel storage and dispensing, metal parts cleaning with volatile solvents, spray finishing operations, dry cleaning, and large-scale printing. Emission limits of 10 tons per year are equivalent to emissions of approximately 10 gallons per day. The verification

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<sup>1</sup>U.S. Army Environmental Hygiene Agency, *Clean Air Act Amendments of 1990, Impacts on the Department of the Army*, undated.

of emissions and installation of required prevention controls will be very expensive.

Army combustion processes produce nitrogen dioxide (NO<sub>2</sub>) emissions. Processes producing NO<sub>x</sub> that are likely to be regulated under Title I are munitions disposal operations, including open burning and open detonation; engine test cells; incinerators of all types; fossil-fuel-fired boilers; and explosive production processes. The limitations on NO<sub>x</sub> emissions may become more stringent if it is determined that these emissions contribute to the formation of ground-level ozone.

Detailed, comprehensive, and accurate emission inventories are required. These inventories form the basis for source regulation in the nonattainment areas. The conduct of these inventories requires considerable professional expertise that may be beyond the technical capability or time constraints of installation environmental personnel. Annual updates are required and certification of accuracy by a responsible (legally liable) official is required. Environmental budgets must reflect the cost of personnel needed to implement this portion of the program, which includes program oversight and the cost of contractor performance of the inventories. Cost should be identified in appropriate 1383 submissions for the initial and recurring requirement. An evaluation of the current DB 1383 submissions does not indicate that appropriate projects have been proposed to meet these requirements and the requirements for yearly updates. This requirement was identified in the USAEC Environmental Requirements Shortfalls document.<sup>2</sup>

Considerable emission testing for major sources to determine if regulatory standards and/or efficiency of controls are met may be required. It is important to note that the regulatory community is leaning heavily toward the use of continuous emission monitors. In either case, smokestack testing or the installation of continuous emission monitors is expensive and should be appropriately programmed into installation budgets and 1383 submissions.

Additional VOC controls will be required on many sources to meet offset requirements in nonattainment areas if new or modified sources are installed. The cost of these controls will require appropriate budget planning.

Considerable operation, maintenance, reporting, and manpower costs are associated with implementation of additional controls. These costs cannot be absorbed effectively by existing installation budgets or personnel. To put this in some perspective, Pennsylvania has increased its air pollution control staff by 200 workers and plans to hire approximately 200 more people to fully meet its requirements under CAAA-90. Certainly, military installations should immediately increase staffs or contract for additional support.

Considerable opportunity exists for implementing a comprehensive pollution prevention strategy to reduce the use of VOCs. Every effort should be made to seek process substitutes that reduce or eliminate VOC emissions. The metals

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<sup>2</sup>Memorandum SFIM-AEC-EEA, U.S. Army Environmental Center, Subject: *Environmental Requirements Shortfall for POM, 1996 - 2000*, 1 October 1993.

cleaning industry has made considerable progress in substitution of traditional cleaning chemicals. An essential element of any pollution prevention program is implementation of operational changes. Many of the VOC-emitting processes can be modified, often by product substitution, to reduce emissions.

The complexity of the permitting process will increase; it will drive up the cost of permits and the time required for reaction to state notices of deficiencies.

An action plan for banking VOC emission credits should be developed for each installation. Under the emissions averaging provisions, credits can be used to offset emissions that are not easily regulated. Credits may be used to meet offset requirements for new construction or process modifications. Additionally, those credits may be transferable to other installations that need additional offsets. The credits may also be sold. Special consideration should be given to banking of emission credits at installations that are closed or reduced in size.

## **Title II. Mobile Sources**

Although Title II of the CAAA-90 should not have a major impact on the Army, some considerations include the following:

- ◆ Clean-fuel vehicles and the associated clean fuel for operation of these vehicles must be purchased. Requirements go into effect in the 1998 model year.
- ◆ Storage and dispensing facilities for clean and reformulated fuels will be required if existing facilities cannot be used. It will be important to limit the types of clean fuels used in commercial military vehicles to reduce the storage/dispensing requirements.
- ◆ Non-tactical government vehicles must participate in inspection and maintenance programs in ozone and carbon monoxide nonattainment areas. These programs will have an annual inspection requirement to verify compliance with tail pipe emission standards. Implementation of this program will require purchase of testing equipment, training of personnel, and associated administrative costs.
- ◆ Army installations will also be required to verify participation in an inspection and maintenance program by their employees. All employee-owned vehicles, including those licensed in other states must participate in, and meet, the inspection and maintenance program requirements.
- ◆ Military exemptions relative to tail pipe emission standards for selected tactical vehicles will receive increasing scrutiny in nonattainment areas. Engine emissions should be a consideration in the design and modification of tactical vehicles, especially those driven over the road.

### **Title III. Hazardous Air Pollutants**

#### **HAZARDOUS AIR POLLUTANT PERMITS AND EMISSIONS CONTROL**

The first military sources to be affected by Title III include fuel storage and transfer facilities, spray finishing operations, metals coating, metals cleaning using strippers, metals cleaning using blasting/grinding, plating, welding, forging, munitions production, munitions incineration, medical waste incineration, industrial wastewater treatment, and other operations that emit any of the 149 proposed HAPs that will be regulated initially.

The HAP sources will have to make process modifications and/or install control equipment to limit emissions to meet MACT requirements. This could be a massive expense during the next 8 to 10 years when the final rules for all HAP emissions are promulgated.

Performance of the initial emission estimates on HAP sources will require a tremendous effort. The bulk of this effort may not be able to be accomplished with in-house resources.

Sampling of processes for which emission estimates do not provide definitive information regarding regulatory requirements will be time-consuming and expensive. Emission estimates using EPA-approved emission factors are safe-sided and could result in regulation of sources that would otherwise be exempt. Actual emissions should be measured using stack and field sampling when classification requirements warrant such expenditures.

Procurement, installation, and operation and maintenance of continuous emission monitors will consume time, personnel, and money.

Considerable emphasis should be placed on operation and maintenance procedures to promote peak operating efficiency, control leaks and other uncontrolled discharges, and take advantage of every opportunity to minimize HAP emissions. Institution of leak detection and repair programs will be an essential element of this strategy.

Implementation of pollution prevention practices of material substitution, process modification, personnel training, improved work practices, and product modification can help reduce HAPs.

Emission averaging may be the prudent approach to meet the strict upcoming emission limits in many facilities. It may be in the Army's best interest to carefully consider the advantages of implementing an early reduction program for selected HAPs.

The numbers and skill levels of environmental personnel currently dedicated to administration of air pollution control programs are not sufficient to meet the program requirements.

Recordkeeping, reporting, and monitoring requirements will be time- and personnel-intensive. Implementation of comprehensive data base technology that will meet air pollution control and pollution control data requirements for other media must be done quickly.

Careful negotiation with regulators will be required to determine the exact control requirements for many HAP sources. Regulatory concurrence prior to installation of controls will be critical to achieving compliance and conserving scarce environmental funds.

If banking of emission credits for HAPs becomes available, procedures should be established to take credit for all reductions.

Health risk determinations will continue to be the driving force in regulation of pollutants. It is essential that the Army maintain considerable health risk assessment skills to meet its air pollution control requirements.

Risk management planning for facilities that use or store quantities of regulated HAPs in excess of the listed threshold quantities will take considerable time and effort. Development of hazard assessment plans that address downwind impacts, programs to prevent accidental releases, and programs to respond to releases may be beyond the installations' capabilities.

Additional training may be required for several levels of personnel in the risk management planning discipline.

Implementation of the chemical process safety management requirements promulgated under the Occupational Safety and Health Administration (OSHA) will require considerable time and personnel commitments. At minimum, the development of chemical process safety management plans requires the following: risk analysis, development of risk reduction plans, and contingency planning in the event of a hazardous release.

Municipal and medical waste incinerators, both new and existing, will be subject to strict new emission standards. Meeting these standards will require installation of sophisticated and expensive control technology as well as emission-monitoring equipment.

Reporting requirements under both the emissions standards and operational monitoring will require considerable increases in trained personnel.

Incinerator operators must meet EPA-approved training requirements.

In total, the HAP regulations will require massive investments in new equipment (both process and control) and significant increases in requirements for recordkeeping, operational emission testing and tracking, reporting, compliance testing, preventive maintenance, ambient monitoring, and operator training.



## PREVENTION OF ACCIDENTAL RELEASES

Title III also requires development of programs to prevent chemical accidents. The goals of these provisions in the CAAA-90 are to focus on chemicals that pose a significant hazard to the community should an accident occur, to prevent the accidental release of these chemicals, and to minimize the consequences of such releases. EPA proposed the Risk Management Program for Chemical Accidental Release Prevention (RMPCARP)<sup>3</sup> to meet the mandate of the CAAA-90. In addition, Section 304 of the CAAA-90 requires that OSHA promulgate a chemical process safety standard. The OSHA standard's goal is to protect employees from hazards associated with the accidental releases of highly hazardous chemicals in the workplace. The requirements in the CAAA-90 build onto the reporting requirements already established in the Emergency Planning and Community Right-to-Know Act (EPCRA) [Superfund Amendments and Reauthorization Act Title III]. Plans and procedures developed as a result of these regulations will be provided to EPA, state officials, and local emergency planners.

The CAAA-90 establish general duty requirements for owners and operators of stationary sources who produce, handle, or store quantities of regulated chemicals. These general duty requirements are patterned after OSHA's general duty clause (Section 654 of Title 29). General duty clause provisions require owners/operators to identify potential hazards, design and maintain a safe facility, develop plans to prevent accidental releases, and take action to minimize the consequences of accidental releases. These general duty requirements must be met regardless of the quantity of chemical stored.

The CAAA-90 also require EPA to develop a list of at least 100 substances that are known to cause, or may be anticipated to cause, death, injury, or serious adverse human health or environmental effects. EPA proposed this list of substances in the January 19, 1993, *Federal Register*, 58 FR 5102 - 5125. Threshold planning quantities have been established for each of the listed hazardous substances. These thresholds vary from 500 to 10,000 pounds for the toxic chemicals, 10,000 pounds for the flammable substances, and 5,000 pounds for the Department of Transportation Division 1.1 explosives (see 49 CFR 172.102). This list is the first step toward an effective accidental release prevention effort and should serve as a starting point in planning development. The threshold planning quantities apply to the maximum total quantity of a substance in a process, in a vessel, or in several vessels that could be involved at one time in a release. Stationary sources that have any of these listed chemicals in a process above the threshold planning quantity are subject to risk management planning requirements (under the RMPCARP).

The RMPCARP regulations address the use, operation, repair, training, and maintenance of equipment to monitor, detect, inspect, and control releases. These regulations will require development of risk management plans (RMPs) that will include — at minimum — a hazard assessment program. The hazard assessment program must define off-site risks, document a 5-year history of

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<sup>3</sup> 58 FR 54190 - 54219, 20 October 1993.

accidental releases, develop and implement a prevention program, and implement an emergency response program. These RMPs are to be prepared within 3 years of promulgation of the standard (i.e., by 1996). The RMPs are to be registered with the EPA and reviewed by the Chemical Safety and Hazard Investigation Board, the State Emergency Response Commission (SERC), and the Local Emergency Planning Committee (LEPC). The RMPs are also available to the public. The information in the RMPs will complement the information provided to the SERC and the LEPC under the provisions of the EPCRA. The most detailed portion of the RMPs may be the prevention programs. These programs will include the following proposed elements:

- ◆ review and documentation of the plant's chemicals, processes, and equipment;
- ◆ detailed process hazard analyses to identify hazards, assess the likelihood of accidental releases, and evaluate the consequences of such releases;
- ◆ development of standard operating procedures;
- ◆ training employees about procedures;
- ◆ implementation of a preventive maintenance program;
- ◆ management of changes in operations so that altering one part of the process does not cause an accident in another part;
- ◆ reviews before initial start-up of a process and before start-up following a modification of the process;
- ◆ investigation and documentation of accidents; and
- ◆ periodic safety audits to ensure that procedures and practices are being followed.

Section 304 of the CAAA-90 also required OSHA to promulgate a chemical process safety rule: (29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents.) This rule is designed to protect employees from hazards associated with accidental releases of highly hazardous chemicals in the workplace. It requires a comprehensive approach to the management of highly hazardous chemicals. This comprehensive approach is defined in terms of 16 elements that must be included in a Process Safety Management Program.

The requirements of the OSHA Process Safety Management Standard and EPA's RMP are very similar. Programs that meet the OSHA standard will also meet the EPA standard with minimal modifications. The OSHA Process Safety Management Standard was effective on May 26, 1992. The hazard analysis portion of the standard is phased in over 5 years with the most hazardous operations analyzed first. All hazard analysis is to be completed by May 1997. The

EPA Risk Management Program is to be in effect within 3 years of promulgation of the final rule. The final rule should be published in early 1994 with the standard effective in early 1997.

In short, between 1994 and 1996, the Army faces a significant requirement for the establishment of comprehensive risk management planning and analysis at all facilities.

#### Title IV. Acid Deposition Control

The provisions of this title will have little direct effect on the Army because Army utilities are not subject to the provisions of the Clean Air Act regarding acid deposition. However, potential indirect effects include

- ◆ increased cost of purchasing energy from commercial utilities due to their emission control costs;
- ◆ some political pressure on Army facilities, especially those in the Midwest, to comply with the provisions of Title IV; and
- ◆ the Federal Facilities Compliance Act could be interpreted to require Army utilities to meet Federal/state requirements under Title IV.

#### Title V. Permits

The development of permit applications and renewals that include the provisions to demonstrate how operations are performed and how compliance is achieved will be time-consuming and expensive. Environmental planners at all levels will need to provide appropriate funding and staffing to complete the permits. The need for additional funding to support the permitting has been addressed in the October 1993 Environmental Requirements Shortfall for POM (1996 - 2000) memorandum.<sup>4</sup>

Modification of permits because of workflow process changes, modernization, and repair will be time-consuming and expensive and in most cases will require attainment of a new permit.

Closer coordination with state and regional EPA regulators must be accomplished to ensure information is effectively transferred and penalties are avoided.

The payment of fees may well be an unbudgeted requirement at many installations. Actions need to be taken now to estimate permit fees and provide for outyear funding. Current estimates are in excess of \$28.00 per ton of emissions. Installation permit fees could easily meet or exceed \$100,000.

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<sup>4</sup>Memorandum SFIM-AEC-EEA, U.S. Army Environmental Center, Subject: *Environmental Requirements Shortfall for POM (1996 - 2000)*, 1 October 1993.

The emission inventory process is a critical element of the permit requirement. Major sources subject to regulation are determined primarily from the emission estimates obtained from the inventory. Safe-sided emission factors could overestimate emissions and thus require expensive compliance for sources not truly requiring regulation.

Additional source sampling will be required to meet permit demands for several sources. Source sampling in light of the strict testing methods will be a considerable expense for Army installations.

Strict emission limits will require capital investment in controls to achieve compliance. Additional compliance efforts will be centered on improvement of operation and maintenance processes that are personnel-intensive.

## **Title VI. Stratospheric Ozone Protection**

Although military exemptions from regulatory compliance can be granted in the name of national security, the Army's desire to lead the way in environmental protection makes it unwilling to seek such an exemption until it can be demonstrated that there is no other reasonably available course of action. Identifying acceptable substitutes for ozone-depleting substances (ODS) and instituting their use will be one of the major concerns for the Army. Substitutes need to be identified for widely used substances like methyl chloroform and carbon tetrachloride, which are used primarily in parts cleaning. Additionally, CFC-113 is used as a precision parts cleaner of electronic devices and circuit boards.<sup>5</sup>

Acceptable substitutes for motor vehicle/appliance refrigerants (CFC-12, HCFC-22) must be procured.

The use of halons as fire suppressants certainly requires evaluation. Acceptable substitutes for halon must be located and procured or exceptions must be requested and granted. Replacements for halon used in tactical vehicles may present the greatest challenge because the replacement product must be safe for vehicle occupants.

Installations have already been required to recycle/capture ozone-depleting refrigerants from vehicle air conditioners. Additionally, personnel performing this maintenance must have received proper training and be certified to perform this recycling work.

Maintenance practices relative to vehicles/appliances/devices that use ODS must be revised. Methods of recycling these substances will be required and

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<sup>5</sup>The Significant New Alternative Program (SNAP) proposes use of the following non-ozone depleting substances for metal parts cleaning: semiaqueous/aqueous processes (which meet 70 percent of the demand in industry), organic solvents, and other chlorinated organic solvents (e.g., trichloroethylene, perchloroethylene, and methylene chloride). The proposed SNAP provides a wide range of approved substitute chemicals.

personnel will require specific training and certification much like that required for work on automobile air conditioners.

Procurement regulations will require revision to conform with the Title VI requirements. Care must be exercised to ensure that only EPA-approved substitutes are purchased.

Programs must be developed to evaluate the effectiveness of EPA-approved substitutes for unique processes. If processes exist in which the substitutes do not provide acceptable performance, requests for exceptions must be submitted to EPA.

## **Title VII. Enforcement Provisions**

Enforcement actions can be costly. Civil penalties of \$5,000 per day per violation can be administered by levying on-the-spot fines. Fines accumulate until compliance is achieved. Failure to comply with major provisions can result in fines of as much as \$25,000 per day per violation.

Both civil and criminal penalties target top management. Workers and technical advisors are generally not liable.

Military leaders should be made very aware of these requirements. Strict enforcement can be expected and the senior leadership must be well-informed regarding the consequences.

Mechanisms must be developed to keep the Army's management officials aware of their environmental compliance status.

## **Title VIII. Miscellaneous Provisions**

Title VIII does not contain provisions that will have a significant impact on the U.S. Army.

## CHAPTER 6

# Conclusions and Recommendations

We have analyzed the historical EA data from the DESR and ACTS data bases. The data set spans the period from 1984 to the present.

The DESR (1984 to 1989/1990) data did not provide all the information needed to conduct a detailed trend analysis. From the DESR, we could not determine the *reason* for each EA and its underlying causes. And while there are errors and gaps in those data, the DESR data do provide a good picture of the compliance status of the air pollution program during this time. The data clearly establish that the Army's record in maintaining compliance with air pollution laws during this period was outstanding. On average, 99 percent of all sources of emission were in compliance from 1984 to 1989. Additionally, the Army's ability to resolve EAs improved consistently throughout the period to the point in 1989 when nearly 90 percent of the EAs received were resolved in the same year of receiving a citation.

The majority of the EAs issued were for administrative violations (72 percent), while the remaining 28 percent of the EAs required some type of capital investment to achieve compliance. In reviewing DB 1383 project submissions for the period 1988 to 1992, we found that (after a slow startup period in 1988) the trends in the numbers and dollar amounts of projects requested for funding matched regulatory requirements and emphasis areas very well. The shortfalls we identified were primarily in training and projects to support compliance with NAAQS (1992 only).

We analyzed the historical data (1990 to 1993) in the ACTS data base. Each EA was assigned a reason code allowing a much more detailed trend analysis to be performed. We found that between 72 percent and 81 percent of the EAs were received for administrative or procedural violations. Simply stated, the installations could have met regulatory requirements, but some error caused non-compliance. This trend is nearly identical to the earlier DESR trend where 72 percent of all the EAs received were for administrative violations. EAs resulting from inadequate facilities accounted for between 10 percent and 19 percent of the total violations.

We investigated 55 separate EAs from 22 Army installations. We contacted the installations' environmental staffs and discussed the reasons the EAs occurred and their underlying causes. Our analysis identified four primary underlying causes: lack of environmental knowledge, lack of management attention (poor supervision), contract problems, and lack of resources and funding. These underlying causes are closely linked and often cited together as the causes of specific EAs. Again, the trends suggested by the DESR and by the use of the EA

data base are confirmed: The vast majority of the EAs issued are the result of problems that are easily correctable at the installation level.

We also reviewed the CAAA-90 and assessed their potential impacts on the Army. The major impacts will be from the regulations in Title I (Attainment of NAAQS), Title III (Hazardous Air Pollutants), Title V (Permits), and Title VI (Stratospheric Ozone Protection).

Title I (Attainment and Maintenance of the National Ambient Air Quality Standards) requires the following:

- ◆ Emissions of VOCs in nonattainment areas will be regulated strictly.
- ◆ Many previously exempt sources such as painting, coating, parts cleaning, and drycleaning will have to meet strict emission standards.
- ◆ Emission inventories documenting potential or actual releases are required yearly.
- ◆ Emissions from new construction must be offset by reductions from existing sources.

Title III (Hazardous Air Pollutants) will most likely require the following:

- ◆ Emission standards for regulated source categories will be rigorous. (The Army may be required to comply with all provisions that regulate hazardous chemical releases.)
- ◆ Regulated source emissions must be extensively evaluated.
- ◆ Extensive monitoring, recordkeeping, reporting, and operator training requirements must be met.
- ◆ Risk management plans designed to protect the public and workers must be developed and implemented.

Title V (Permits) will require the following:

- ◆ Regulated sources must identify and quantify emissions, and develop compliance plans and permit applications.
- ◆ Regulated sources will be subject to annual permitting fees based on annual emissions. These permit fees could exceed \$100,000 per pollutant per source in extreme cases.

Title VI (Stratospheric Ozone Protection) requires replacement of ODS in accordance with established goals.

Our analysis indicates that Army installations have not been aggressive in identifying projects to meet the requirements of the CAAA-90. A review of the projects in the DB 1383 data base indicates major shortfalls in projects submitted to meet the regulatory requirements. Installations must be encouraged to submit appropriate projects to meet regulatory requirements. The U.S. Army Environmental Center personnel responsible for management of the air pollution program are well-aware of these shortfalls and have identified the need for additional funding in the budget cycle. This shortfall submission is an excellent estimate of the funding requirements necessary to achieve compliance with the CAAA-90. It may also be appropriate to include training requirements as a separate line item in the next submission of the shortfall document.

In other regulatory programs, we found similar systemic problems. Actions initiated to eliminate the systemic problems in this program will assist in elimination of similar deficiencies in other programs. The remainder of this chapter discusses the need for programs to eliminate or reduce the impact of the systemic problems.

## KEEPING UP WITH THE TREADMILL

The CAAA-90 are very complex and difficult to understand. Some of the regulations, most notably the HAPs, are still being promulgated, along with many state regulations. It is very difficult just to keep up with the changing regulatory requirements, let alone to look ahead to identify future regulatory concerns and plan accordingly. Several EAs were received because the environmental staff was simply not aware of the specific regulatory requirements. Additional EAs were received because installation personnel responsible for the operation of the regulated sources were not fully trained and were not aware of their responsibilities for operating within the conditions of permits.

### Cadre of Qualified Professionals

Lack of regulatory knowledge was the most common underlying cause of all EAs. This clearly points to the need to hire personnel who are qualified as environmental professionals. Installation commanders must recognize and support the need for maintaining a highly qualified and trained environmental staff. No simple analytical tool is available to determine appropriate staffing levels for installation environmental compliance activities. The Army needs such a tool as a general yardstick to justify the need for such staffing as well as to identify cases where alleged understaffing is in fact not the case.

The staff must also be kept current in their profession through continuing specialty education programs. Environmental personnel assigned the responsibility for the air pollution program will require considerable additional training to keep up with regulations during the next few years. The CAAA-90 will require specific training and possibly certification of personnel who operate the



regulated facilities. Supervisors must also be qualified professionals. Supervisors need environmental awareness training and may also require some level of certification. All these training requirements must be carefully identified and input to the DB 1383 system. Our analysis showed that DB 1383 submissions for training were very limited. Installations should verify that they have included their full complement of training needs in their DB 1383 submissions. Some operational funding may be required to augment the training funds requested in the DB 1383 submissions.

## Management Oversight

Lack of management oversight, especially at the first line supervisory level, was the second most common underlying cause of the EAs. This cause was frequently cited along with lack of regulatory knowledge. Certainly, supervisors at all levels require environmental awareness training; however, management oversight requirements go far beyond just environmental awareness training. Our analysis showed that the supervisors did not have the time, the detailed knowledge, or a system in place to verify that compliance-sensitive actions were properly performed. Managers at all levels have the responsibility for ensuring that supervisors allocate their time appropriately. Where all time is being used as efficiently as possible and shortfalls exist, managers must pursue additional resources more aggressively. Although this can be a challenging task, some installations have been very good at it; those that have not might be able to learn some tips and tricks from those that have been able to add the necessary staff.

One method of identifying where additional effort is needed is through an effective, aggressive, internal environmental compliance monitoring program that supplements the Army's ECAS program. These assessment programs will not ensure compliance on a daily basis but will go a long way toward identifying systemic problems and serving as a starting point for more detailed, supervisory-level audits that do verify compliance on a daily basis. Installations must dedicate resources to development of effective internal audit programs that are keyed to specific compliance requirements. First-line supervisors must implement those audit programs at the operational level for them to be effective.

## Diversity of Regulatory Requirements

The regulations under the CAA can vary widely from state to state. Even when qualified personnel (who have sufficient backgrounds in general air pollution abatement) are hired from within the Federal system, they may lack the specific understanding of the local regulations or state-set permit conditions. In these cases, training that emphasizes state and local requirements would provide the greatest benefit. Structured centralized training tends to focus on the idealized Federal model and therefore is unlikely to address the state-specific needs of installation compliance specialists. The best approach to training installation personnel may be to work through regulators or contractors that are well-versed in the requirements for their states.

## Environmental Awareness

Compliance with all the environmental laws requires a team effort. Compliance cannot be achieved unless all the personnel involved with environmental laws have the requisite level of environmental training. While great strides have been made in environmental awareness training throughout the Army, preventable EAs continue to occur. Additional emphasis must be placed on environmental awareness training throughout the Army. Installation commanders must stress environmental stewardship and compliance with all environmental regulations.

## FUNDING

Funding for compliance with the provision of the CAAA-90 will be a major concern. The proposed regulations have the potential, when fully enacted, to be the most costly regulations promulgated since the passage of RCRA. It is essential that environmental personnel carefully assess the need for new or modified activities and facilities to maintain installation compliance with these regulations and to make appropriate project submissions to the DB 1383 system. A proactive approach to submitting these projects must be taken. Our review of the DB 1383 project submissions showed a considerable shortfall in each of the four main areas of the CAAA-90.

Sufficient projects have not been identified to support the cost of air emission inventories (Title I), compliance with hazardous air pollutants regulations (Title III), permit plan development and permitting costs (Title V), and compliance with the staged elimination of ODS (Title VI). Fortunately, AEC air pollution program personnel have identified these shortfalls and additional funding needs in the budget process. Despite their efforts, installations must develop their own specific projects to achieve compliance. The cost estimates provided by those projects should give a much more accurate estimate of the true cost of compliance with these amendments.

## CONTRACT MANAGEMENT

Contract management was the third most common underlying cause cited for receipt of EAs. The majority of the EAs dealt with the mismanagement of asbestos abatement actions. The contractors were usually cited for failure to follow administrative procedures rather than for exposing workers and the community to emissions in excess of standards. The contractors either did not know their jobs or just failed to follow the regulatory requirements. In some cases, contractors actually ignored the regulatory requirements. The EAs could have been prevented if installation personnel had exercised proper contractor oversight. The specific procedures that were violated could have been easily identified by installation personnel. The installations' staffs often did not have the time or personnel to execute the oversight, and they also quite often felt technically unequal

to posing a challenge to the contractor. Although installation personnel use contractors to perform duties they cannot perform due to manpower limitations or lack of expertise, responsibility for compliance does not shift wholly to the contractor. The Army is still responsible for compliance and must have procedures in place to provide adequate contractor oversight.

## SUMMARY OF RECOMMENDATIONS

We recommend that the Army take the following actions:

- ◆ Execute proper management supervision of personnel operating regulated systems.
- ◆ Provide proper contract management and oversight.
- ◆ Increase emphasis on cost estimates for environmental compliance.
- ◆ Make every effort to hire enough fully qualified and trained environmental personnel and pollution-control system operators to implement the installation environmental program. Consider development of incentive pay programs for environmental professionals in areas where recruitment is particularly difficult.
- ◆ Develop a mechanism to quantify the appropriate staffing levels for environmental compliance.
- ◆ Provide for initial certification and continuing professional development training for environmental professionals and other personnel connected with the environmental mission.
- ◆ Provide increased emphasis on the identification of the environmental compliance and awareness training needs for all installation personnel.
- ◆ Increase the level of environmental compliance and awareness training provided to first-line supervisors responsible for the operation of regulated facilities.
- ◆ Submit projects to fund environmental compliance and awareness training to the DB 1383 system. Pay special attention to the operator training requirements in proposed CAAA-90 regulations.
- ◆ Institute internal audit programs that are modeled after the ECAS audit process and keyed to specific compliance requirements.
- ◆ Provide increased oversight of contractors responsible for operating regulated facilities or conducting other activities regulated under air pollution regulations.

- ◆ Conduct research to determine the appropriate level of operation and maintenance funding for regulated facilities and identify these requirements in the budget process.
- ◆ Increase the emphasis on identification and submission of environmental project requests that will be required to comply with the CAAA-90. Requirements for compliance with NAAQS, HAPs, VOCs, and permitting will require the greatest amount of funding.
- ◆ Investigate the applicability of, and procedures for, "emissions trading" and determine whether and how the Army should become involved in such trading.

**APPENDIX A**

**Defense Environmental Status  
Report Format**

**Table A-1.****Defense Environmental Status Report – Air Pollution Data Form**

PERIOD COVERED: FY \_\_\_\_\_

COMPONENT \_\_\_\_\_

COMPLIANCE DATA		AS OF LAST PERIOD	AS OF CURRENT PERIOD
<b>1</b>	<b>NO. OF INSTALLATIONS*</b>		
	<b>A. WITH MAJOR AIR POLLUTION SOURCES*</b>		
	<b>B. WITH MAJOR AIR POLLUTION SOURCES OUT OF COMPLIANCE*</b>		
<b>2.</b>	<b>NO. OF MAJOR AIR POLLUTION SOURCES</b>		
	<b>A. IN BEING</b>		
	<b>B. OUT OF COMPLIANCE ON 9/30</b>		
<b>3.</b>	<b>NO. OF MINOR POLLUTION SOURCES*</b>		
	<b>A. IN BEING</b>		
	<b>B. OUT OF COMPLIANCE ON 9/30</b>		
<b>4.</b>	<b>NO. OF NOTICES OF VIOLATION (NOVs)*</b>		
	<b>A. NO. OF NOV<sub>s</sub> UNRESOLVED AT THE START OF PERIOD</b>		
	<b>1. NOV<sub>s</sub> WHICH REQUIRE ADMINISTRATIVE OR OPERATIONAL CHANGES TO RESOLVE</b>		
	<b>2. NOV<sub>s</sub> WHICH REQUIRE POLLUTION ABATEMENT PROJECT(S) TO RESOLVE</b>		
	<b>B. NO. OF NOV<sub>s</sub> RECEIVED DURING PERIOD (TOTAL)</b>		
	<b>1. NOV<sub>s</sub> WHICH REQUIRE ADMINISTRATIVE OR OPERATIONAL CHANGES TO RESOLVE</b>		
	<b>2. NOV<sub>s</sub> WHICH REQUIRE POLLUTION ABATEMENT PROJECT(S) TO RESOLVE #</b>		
	<b>C. NO. OF NOV<sub>s</sub> RESOLVED DURING PERIOD (TOTAL)</b>		
	<b>1. BY ADMINISTRATIVE OR OPERATIONAL METHODS</b>		
	<b>2. BY POLLUTION ABATEMENT PROJECT(S) #</b>		

NOTE: TERMS MARKED WITH AN ASTERISK ARE DEFINED IN THE GLOSSARY.

NOTE: #: PROVIDE A LIST OF A-160 (OR 1383) PROJECT NUMBERS FOR THESE PROJECTS.

APPENDIX B

**Summary of Defense Environmental  
Status Report Trends  
(1984 to 1989 by Major Command)**

# Summary of Defense Environmental Status Report Trends (1984 to 1989 by Major Command)

**Table B-1.**  
**Master Summary – DESR Trends – Air Pollution**

Sources and EAs	Year					
	1984	1985	1986	1987	1988	1989
Installations with major AP sources	53	52	53	54	52	50
Installations with major AP sources out of compliance	13	3	5	2	3	3
Major air pollution sources in being	399	499	422	430	470	377
Major air pollution sources out of compliance	3	3	5	2	5	3
Minor air pollution sources in being	1,473	1,450	1,605	1,919	1,750	2,090
Minor air pollution sources out of compliance	10	21	14	11	19	96
EAs unresolved at start of period	11	19	15	13	12	18
EAs requiring administrative changes to resolve	4	17	12	6	6	10
EAs requiring abatement projects to resolve	0	2	4	7	6	8
EAs received during this period (total)	16	21	22	26	19	25
EAs received requiring administrative changes to resolve	11	20	19	21	16	18
EAs received requiring abatement projects to resolve	0	10	4	5	3	7
EAs resolved during this period (total)	9	13	13	23	14	22
EAs resolved via administrative changes	1	12	13	20	12	14
EAs resolved via abatement projects	0	1	1	3	2	8
Total EAs start of period plus EAs received during period	27	40	38	39	31	43
Total EAs requiring administrative changes to resolve	15	37	31	27	22	26
Total EAs requiring abatement projects to resolve	0*	3	8	12	9	15

Note: AP = air pollution; DESR = Defense Environmental Status Report; EAs = enforcement actions. The DESR used the term "NOV" in its data collection process (see Appendix A).

\*The data totals do not add up in some cases. This is due to minor errors in compilation of the data from installations through the major commands for consolidation at Army level. Despite these minor mathematical imperfections, the data are very useful for trend analysis.



**Table B-2.**  
***Installations with Major Air Pollution Sources***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	1	1	1	1	0	3
USMA	0	0	0	0	0	1
TRADOC	8	6	5	4	4	5
MTMC	0	0	0	0	0	0
MDW	3	3	3	3	3	5
ISC	0	0	0	0	0	0
INSCOM	0	2	0	0	0	0
HSC	2	2	2	2	1	1
FORSCOM	8	8	13	13	15	6
ARNG	0	0	0	0	0	1
AMC	31	30	29	31	29	28
Total	53	52	53	54	52	50

*Note:* WESTCOM = ; USMA = ; TRADOC = Training and Doctrine Command; MTMC = Military Traffic Management Command; MDW = ; ISC = Information Systems Center; INSCOM = ; HSC = Health Services Command; FORSCOM = Forces Command; ARNG = Army National Guard; AMC = Army Materiel Command.

**Table B-3.**  
***Installations with Major Air Pollution Sources out of Compliance***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	0	0
TRADOC	1	1	2	1	1	2
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	0	1
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	10	0	0	0	0	0
ARNG	0	0	0	0	0	0
AMC	2	2	3	1	2	0
Total	13	3	5	2	3	3

**Table B-4.**  
**Major Air Pollution Sources in Being**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	1	1	1	1	0	3
USMA	0	0	0	0	0	3
TRADOC	24	22	20	4	7	8
MTMC	0	0	0	0	0	0
MDW	3	3	3	3	82	81
ISC	0	0	0	0	0	0
INSCOM	0	4	0	0	0	0
HSC	3	3	2	2	1	2
FORSCOM	43	38	47	97	19	85
ARNG	0	0	0	0	0	1
AMC	325	329	349	323	361	194
Total	399	400	422	430	470	377

**Table B-5.**  
**Major Air Pollution Sources out of Compliance**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	0	0
TRADOC	1	1	2	1	1	2
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	0	1
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	0	0	0	0	0	0
ARNG	0	0	0	0	0	0
AMC	2	2	3	1	4	0
Total	3	3	5	2	5	3

**Table B-6.**  
**Minor Air Pollution Sources in Being**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	7	7	9	9	9	10
USMA	14	11	11	23	23	19
TRADOC	297	314	344	312	307	376
MTMC	37	37	37	37	38	0
MDW	0	0	0	0	79	84
ISC	0	0	0	0	0	0
INSCOM	0	0	4	0	0	0
HSC	7	6	1	5	6	4
FORSCOM	363	370	344	326	398	472
ARNG	53	0	137	145	151	102
AMC	695	705	718	1,062	739	1,023
Total	1,473	1,450	1,605	1,919	1,750	2,090

**Table B-7.**  
**Minor Air Pollution Sources out of Compliance**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	1	1	0
TRADOC	0	0	1	1	3	4
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	2	0
ISC	0	0	0	0	0	0
INSCOM	0	0	2	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	3	9	10	2	3	36
ARNG	0	0	0	2	4	28
AMC	7	12	1	5	6	28
Total	10	21	14	11	19	96

**Table B-8.**  
**EAs Unresolved at Start of Period**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	1	1
TRADOC	0	7	1	1	5	5
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	0	2
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	4	9	8	2	0	1
ARNG	0	0	0	5	2	3
AMC	7	3	6	5	4	6
Total	11	19	15	13	12	18

**Table B-9.**  
**EAs Requiring Administrative or Operational Changes to Resolve — Start**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	1	0
TRADOC	0	7	1	0	3	5
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	0	2
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	4	9	8	2	0	1
ARNG	0	0	0	3	1	1
AMC	0	1	3	1	1	1
Total	4	17	12	6	6	10

**Table B-10.**  
***EAs Requiring Abatement Projects to Resolve — Start***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	0	1
TRADOC	0	0	1	1	2	0
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	0	0
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	0	0	0	0	0	0
ARNG	0	0	0	2	1	2
AMC	0	2	3	4	3	5
Total	0	2	4	7	6	8

**Table B-11.**  
***EAs Received During This Period (total)***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	1	1	0
TRADOC	7	3	4	6	4	4
MTMC	0	0	0	0	1	0
MDW	0	0	0	0	2	3
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	1	0
FORSCOM	4	8	2	9	3	5
ARNG	1	0	6	2	2	7
AMC	4	10	10	8	5	6
Total	16	21	22	26	19	25

**Table B-12.**  
**EAs Received This Period Requiring Administrative Changes**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	1	0
TRADOC	7	3	3	5	3	2
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	2	3
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	1	0
FORSCOM	4	8	2	9	3	3
ARNG	0	0	4	0	1	6
AMC	0	9	10	7	5	4
Total	11	20	19	21	16	18

**Table B-13.**  
**EAs Received This Period Requiring Abatement**

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	1	0	0
TRADOC	0	0	2	1	1	2
MTMC	0	0	0	0	1	0
MDW	0	0	0	0	0	0
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	0	9	0	0	0	2
ARNG	0	0	2	2	1	1
AMC	0	1	0	1	0	2
Total	0	10	4	5	3	7

**Table B-14.**  
***EAs Resolved During This Period (Total)***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	2	1
TRADOC	0	3	2	2	2	2
MTMC	0	0	0	0	1	0
MDW	0	0	0	0	1	5
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	1	3	4	8	3	1
ARNG	1	0	1	5	2	7
AMC	7	7	6	8	3	6
Total	9	13	13	23	14	22

**Table B-15.**  
***EAs Resolved via Administrative Changes***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	2	0
TRADOC	0	3	2	2	2	1
MTMC	0	0	0	0	0	0
MDW	0	0	0	0	1	5
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	1	3	4	8	3	0
ARNG	0	0	1	3	2	6
AMC	0	6	6	7	2	2
Total	1	12	13	20	12	14

**Table B-16.**  
***EAs Resolved via Abatement Projects***

Installation	Year					
	1984	1985	1986	1987	1988	1989
WESTCOM	0	0	0	0	0	0
USMA	0	0	0	0	0	1
TRADOC	0	0	1	0	0	1
MTMC	0	0	0	0	1	0
MDW	0	0	0	0	0	0
ISC	0	0	0	0	0	0
INSCOM	0	0	0	0	0	0
HSC	0	0	0	0	0	0
FORSCOM	0	0	0	0	0	1
ARNG	0	0	0	2	0	1
AMC	0	1	0	1	1	4
Total	0	1	1	3	2	8



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## APPENDIX C

# Installation Case Studies

# Installation Case Studies

## INSTALLATION A

### EA #1<sup>1</sup>

#### EA DESCRIPTION — FAILURE TO OBTAIN PERMIT FOR ASBESTOS REMOVAL.

*Narrative* — The contractor improperly reported asbestos removal actions. The contractor did not inform the state of asbestos removal projects in six buildings; instead, the state received notification from the Environmental Protection Agency (EPA) officials, who were notified by installation personnel. The notification did not contain adequate information regarding the removal contractor; the size, age, and prior use of the buildings affected; the amount of asbestos material to be abated; the approved abatement methods to be used; the location of the asbestos disposal site; and proof of certification of the abatement contractor. Furthermore, installation personnel were confused about the dates of removal actions at each site.

*Reason for violation* — Due to the length of time that has passed since the EA was issued and due to staffing turnover at the installation environmental office, little information there is available about the circumstances surrounding the underlying reasons for this EA. The contractor probably made errors and failed to perform necessary duties. The installation lacked the resources to hire sufficient staff to oversee the contractor's work.

#### *Summary of underlying cause(s)*

- ◆ Contractor problem
- ◆ Lack of resources/funding
- ◆ Miscellaneous — unknown.

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<sup>1</sup> EA = Enforcement Action.

## INSTALLATION A (CONTINUED)

### EA #2

**EA DESCRIPTION — FAILURE TO MAINTAIN THE MINIMUM TEMPERATURE REQUIREMENTS IN THE SECONDARY CHAMBER OF THE INFECTIOUS WASTE INCINERATOR.**

*Narrative* — The state regulator's records indicated that the installation violated the minimum temperature requirements 80 times during a 6-month period. In addition, the incinerator was charged with waste before the 15-minute waiting period (warm-up period) had elapsed.

*Reason for violation* — There was a misunderstanding between the installation environmental personnel and the regulators. The installation staff relied on information regarding permit requirements originally given to them by the regulators, and they used that information to interpret the requirements of the regulation. Later, the regulators changed their position. Since the environmental personnel had interpreted the original permit requirements information incorrectly, the installation's operations violated the Clean Air Act (CAA) and the regulators issued an EA.

*Summary of underlying cause(s)* — Regulator error/confusion.

## INSTALLATION A (CONTINUED)

### EA #3

EA DESCRIPTION (FINDING #1) — PAINT USAGE DATA NOT AVAILABLE FOR INSPECTION.

EA DESCRIPTION (FINDING #2) — UNKNOWN NATURAL GAS USAGE AT FACILITY.

EA DESCRIPTION (FINDING #3) — OPERATING PAINT BOOTH WITHOUT A PERMIT.

*Narrative* — The installation's environmental personnel failed to maintain paint spray booth records required by the operating permit. The staff failed to obtain a permit to operate a paint spray booth. The personnel also failed to maintain records required by the permit for natural gas usage.

*Reason for violation* — Because of the length of time that has passed since the EA was issued and due to staffing turnover at the installation environmental office, little information is available about the circumstances surrounding the underlying reasons for this EA. The environmental office probably lacked the resources to hire sufficient staff to carry out the work and to provide training.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

## INSTALLATION A (CONTINUED)

### EA #4

#### EA DESCRIPTION (FINDING #1) — FAILURE TO APPLY FOR PERMIT 60 DAYS PRIOR TO EXPIRATION.

*Narrative* — The installation's environmental personnel failed to apply for an operating permit 60 days prior to expiration of the existing permit.

*Reason for violation* — The environmental office managers were busy with other work and unable to keep track of details such as this. The managers lacked the funds to hire additional staff to assist them.

#### *Summary of underlying cause(s)*

- ◆ Lack of management attention/poor supervision
- ◆ Lack of resources/funding.

#### EA DESCRIPTION (FINDING #2) — FAILURE TO APPLY FOR A CONSTRUCTION PERMIT.

*Narrative* — The installation failed to apply for a construction permit for a new gas-fired boiler.

*Reason for violation* — The construction workers did not know they were supposed to apply for a construction permit to install a new boiler. These workers needed additional training.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

#### EA DESCRIPTION (FINDING #3) — FAILURE TO MAINTAIN REQUIRED OPERATING RECORDS AT PAINT SPRAY BOOTHS.

*Narrative* — The installation failed to maintain the required operating records at the paint spray booths.

*Reason for violation* — The installation's environmental office did not have enough staff members to keep up with its workload and lacked the funding to hire additional personnel. Also, existing staff members did not have adequate training and were unaware of the requirement.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

## INSTALLATION A (CONTINUED)

### EA #5

**EA DESCRIPTION — COMMENCED MODIFICATION OF BOILER PRIOR TO APPLYING FOR PERMIT.**

*Narrative* — The installation's environmental personnel failed to apply for a construction permit for modification of a boiler prior to starting the construction work. Permits for modification/construction and operation of these facilities are required under state regulations. This source must meet the new source review requirements.

*Reason for violation* — The construction workers did not know they were supposed to apply for a permit to modify a boiler. These workers needed additional training.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

# INSTALLATION B

## EA #1

EA DESCRIPTION (FINDING #1) — FAILURE TO NOTIFY STATE OF IN-HOUSE ABATEMENT OF ASBESTOS.

EA DESCRIPTION (FINDING #2) — FAILURE TO WET BUNKER DURING STRIPPING OPERATIONS.

EA DESCRIPTION (FINDING #3) — REGULATED ASBESTOS-CONTAINING MATERIALS (RACM) NOT ADEQUATELY WETTED OR CONTAINED.

EA DESCRIPTION (FINDING #4) — IMPROPER LABELING OF RACM.

EA DESCRIPTION (FINDING #5) — EXCEEDED TIME OF STORAGE FOR RACM.

*Narrative* — The regulator issued an EA with multiple findings under the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61, Subpart M. The installation environmental staff failed to notify the state of asbestos removal operations performed by in-house personnel. In addition, the workers used improper asbestos stripping procedures because they did not properly wet the regulated asbestos-containing materials (RACM) stored in a bunker. The RACM stored in the bunker were improperly wetted, improperly stored, and improperly labeled. Finally, the workers did not dispose of the RACM stored in the bunker in a timely manner.

*Reason for violation* — Installation environmental managers made faulty decisions regarding the handling of the RACM. As a result of these decisions, the managers chose to await an event that did not happen. They permitted the RACM to stay in place too long, and did not dispose of the RACM within a reasonable time, which led the regulators to issue an EA. Management stated that the problem could have been prevented if the environmental office had been given funds to hire additional staff.

### *Summary of underlying cause(s)*

- ◆ Lack of management attention/poor supervision
- ◆ Lack of resources/funding.



## INSTALLATION B (CONTINUED)

### EA #2

EA DESCRIPTION (FINDING #1) — FAILURE TO RECORD SECONDARY THERMAL INCINERATOR CHAMBER AT REQUIRED TEMPERATURE.

EA DESCRIPTION (FINDING #2) — FAILURE TO CONTINUOUSLY RECORD SCRUBBING LIQUID pH.

EA DESCRIPTION (FINDING #3) — FAILURE TO MAINTAIN ADEQUATE SCRUBBING LIQUID pH.

EA DESCRIPTION (FINDING #4) — FAILURE TO MONITOR AND RECORD SUPPLEMENTAL FUEL FLOW TO INCINERATOR.

EA DESCRIPTION (FINDING #5) — FAILURE TO RECORD PRESSURE DIFFERENTIAL ACROSS SCRUBBING SYSTEM.

EA DESCRIPTION (FINDING #6) — CONTINUOUS EMISSION MONITOR (CEM) NOT MAINTAINED TO ENSURE MONITORING OF OXYGEN AND CARBON MONOXIDE EMISSIONS.

EA DESCRIPTION (FINDING #7) — CEM NOT PROPERLY OPERATED AND CHECKED.

EA DESCRIPTION (FINDING #8) — FAILURE TO CALIBRATE CEM.

EA DESCRIPTION (FINDING #9) — FAILURE TO PERFORM QUALITY ASSURANCE ON MONITORS.

EA DESCRIPTION (FINDING #10) — FAILURE TO REDUCE MONITORING DATA.

EA DESCRIPTION (FINDING #11) — FAILURE TO MAINTAIN RECORDS AND REQUIRED PERMIT.

*Narrative* — The state issued an EA listing 11 findings related to the installation hospital's infectious waste incinerator:

1. The operators failed to maintain the secondary chamber of the incinerator at the permit-required temperature of 1800 °C. The temperature in the secondary chamber consistently dropped when the incinerator was charged.
2. The operators failed to maintain continuous monitoring of the scrubber fluid pH due to inoperative equipment.
3. The operators also failed to maintain the scrubber pH within permit ranges. The pH dropped below 3 when the incinerator was charged; the pH should have remained between 7 and 8.
4. The operators did not monitor the supplemental fuel flow to the incinerator as required in the operating permit.

5. The operators failed to record the pressure differential across the scrubbing system as specified in the permit.
6. The continuous emission monitor (CEM) did not measure and record the oxygen and carbon monoxide concentrations in the exhaust stack.
7. The CEM did not meet the requirements specified in 40 CFR 60, Appendix B, and it had not been field-tested.
8. The workers did not properly operate the CEM. They did not zero and span the CEM on a daily basis.
9. The CEM quality assurance program did not have adequate quality control provisions, and the monitors were not evaluated on a quarterly basis.
10. The monitoring data obtained from the CEMs were not reduced to hourly average concentrations as required by the permit.
11. Appropriate records and a copy of the operating permit were not kept at the hospital as required.

*Reason for violation* – The EA resulted from an operator problem. The workers were inadequately trained in the handling of the equipment. Although the equipment was new, equipment failures still occurred because the individuals working with the equipment did not understand what they were supposed to do.

*Summary of underlying cause(s)* – Lack of environmental knowledge.

# INSTALLATION C

## EA #1

**EA DESCRIPTION — TWO VAPOR DEGREASERS WERE UNCOVERED AND WERE WITHOUT ADEQUATE FREEBOARD RATIO.**

*Narrative* — The installation operated two vapor degreasers without covers and adequate freeboard. These operational deficiencies allowed emissions of degreasers, a violation of Regulation III, Section 3.05.

*Reason for violation* — The EA resulted from the ignorance of the operators. They did not know the degreasers needed covers and freeboard.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

## INSTALLATION C (CONTINUED)

### EA #2

EA DESCRIPTION — FAILURE TO PERFORM EMISSION TESTING.

*Narrative* — The installation failed to perform hydrochloric acid emission testing on the incinerator/boiler. This standard went into effect on January 1, 1991. The regulatory background indicates that regulators gave advance notice of rule-making procedures and that the procedures themselves were well publicized, beginning in January of 1989.

*Reason for violation* — Despite the publicity surrounding the new standard, the operators did not know they were supposed to perform the hydrochloric acid emission test.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

## INSTALLATION C (CONTINUED)

### EA #3

#### EA DESCRIPTION — BURNING OF PROHIBITED MATERIALS.

*Narrative* — The installation personnel violated local regulations by burning prohibited materials. In coordination with the Fire Department, installation workers open-burned debris from the demolition of a building. The demolition debris included some rolled roofing, a material that must not be burned according to county regulations.

*Reason for violation* — The EA resulted from the ignorance of operators. They did not know that the county prohibited the burning of roofing materials.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

## INSTALLATION C (CONTINUED)

### EA #4

EA DESCRIPTION (FINDING #1) — FAILURE TO COLLECT ASBESTOS-CONTAINING MATERIALS (ACM) AT THE END OF THE WORKING DAY (FIRST BUILDING).

EA DESCRIPTION (FINDING #2) — FAILURE TO CONTAIN ACM AT THE WORKSITE IN A CONTROLLED AREA UNTIL THESE MATERIALS WERE TRANSPORTED TO AN APPROVED WASTE SITE FOR DISPOSAL (FIRST BUILDING).

EA DESCRIPTION (FINDING #3) — FAILURE TO SEAL ASBESTOS-CONTAINING WASTE MATERIALS (ACWM) IN LEAK-TIGHT CONTAINERS AFTER WETTING TO ENSURE THEY REMAINED ADEQUATELY WETTED UNTIL THEY WERE TRANSPORTED FOR DISPOSAL (FIRST BUILDING).

EA DESCRIPTION (FINDING #4) — FAILURE TO NOTIFY THE REGULATORY AUTHORITY OF DEVIATIONS FROM THE NOTICE OF INTENT (SECOND BUILDING).

EA DESCRIPTION (FINDING #5) — FAILURE TO COLLECT ACM AT THE END OF THE WORKING DAY (SECOND BUILDING).

EA DESCRIPTION (FINDING #6) — FAILURE TO CONTAIN ACM AT THE WORKSITE IN A CONTROLLED AREA UNTIL THESE MATERIALS WERE TRANSPORTED TO AN APPROVED WASTE SITE FOR DISPOSAL (SECOND BUILDING).

EA DESCRIPTION (FINDING #7) — FAILURE TO SEAL ACWM IN LEAK-TIGHT CONTAINERS AFTER WETTING TO ENSURE THEY REMAINED ADEQUATELY WETTED UNTIL THEY WERE TRANSPORTED FOR DISPOSAL (SECOND BUILDING).

EA DESCRIPTION (FINDING #8) — FAILURE TO COLLECT ACM AT THE END OF THE WORKING DAY (THIRD BUILDING).

EA DESCRIPTION (FINDING #9) — FAILURE TO CONTAIN ACM AT THE WORKSITE IN A CONTROLLED AREA UNTIL THESE MATERIALS WERE TRANSPORTED TO AN APPROVED WASTE SITE FOR DISPOSAL (THIRD BUILDING).

EA DESCRIPTION (FINDING #10) — FAILURE TO SEAL ACWM IN LEAK-TIGHT CONTAINERS AFTER WETTING TO ENSURE THEY REMAINED ADEQUATELY WETTED UNTIL THEY WERE TRANSPORTED FOR DISPOSAL (THIRD BUILDING).

EA DESCRIPTION (FINDING #11) — FAILURE TO COLLECT ACM AT THE END OF THE WORKING DAY (FOURTH BUILDING).

EA DESCRIPTION (FINDING #12) — FAILURE TO CONTAIN ACM AT THE WORKSITE IN A CONTROLLED AREA UNTIL THESE MATERIALS WERE TRANSPORTED TO AN APPROVED WASTE SITE FOR DISPOSAL (FOURTH BUILDING).

**EA DESCRIPTION (FINDING #13) — FAILURE TO SEAL ACWM IN LEAK-TIGHT CONTAINERS AFTER WETTING TO ENSURE THEY REMAINED ADEQUATELY WETTED UNTIL THEY WERE TRANSPORTED FOR DISPOSAL (FOURTH BUILDING).**

*Narrative* — The regulators issued an EA with multiple findings in connection with asbestos abatement projects at four installation buildings. Installation personnel performed the work. The EA was issued for failure to collect, contain, control, and dispose of asbestos-containing materials.

*Reason for violation* — The installation personnel were removing asbestos-containing siding from the four buildings. The regulators found small pieces of siding on the ground. The installation personnel claimed the pieces of siding came from another job. According to the installation environmental office, a more likely explanation is that, because the pieces of ACM were so small, the installation personnel overlooked them and failed to pick them up. Due to their workload, environmental managers were unable to direct every detail of the abatement project. On the basis of observing pieces of ACM on the ground, the regulators issued an EA with multiple findings for the four abatement sites.

*Summary of underlying cause(s)*

- ◆ Lack of management attention/poor supervision
- ◆ Miscellaneous — human error.

## INSTALLATION C (CONTINUED)

### EA #5

**EA DESCRIPTION — FAILURE TO INSTALL ONE OR MORE NEGATIVE PRESSURE ENCLOSURE (NPE) VIEWING PORTS FOR ASBESTOS-CONTAINING MATERIALS (ACM) PROJECT.**

*Narrative* — The contractor failed to install a viewing port on the wall of the NPE around an asbestos abatement project.

*Reason for violation* — The contractor and the regulator had a disagreement over a regulatory requirement. The contractor felt that the screening material the contractor had placed over the window was adequate, but the regulator said it was not clear enough and that a viewing port was needed.

*Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Regulator error/confusion.



## INSTALLATION C (CONTINUED)

### EA #6

**EA DESCRIPTION — FAILURE TO INSTALL A NEW PORT ON THE WALL OF THE ENCLOSURE DURING WORK ON ASBESTOS PROJECT.**

*Narrative* — The contractor failed to install a viewing port in the wall of the enclosure around an asbestos removal operation.

*Reason for violation* — The contractor and the regulator had a disagreement over a regulatory requirement. The contractor felt that the screening material the contractor had placed over the window was adequate, but the regulator said it was not clear enough and that a viewing port was needed.

*Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Regulator error/confusion
- ◆ Lack of management attention.

Note that this is a recurring action for a continuation of the situation that had been documented in EA #5. Installation supervisors should have ensured that the contractor made the necessary changes once the first EA was received.

# INSTALLATION D

## EA #1

**EA DESCRIPTION — EXCEEDED 500 POUND LIMIT FOR VOLATILE ORGANIC COMPOUNDS (VOCs) ON SIX DIFFERENT OCCASIONS.**

*Narrative* — The installation had VOC emissions in excess of the state's standards of a maximum of 500 pounds per day. The installation performed surface coating operations that had the potential to, and did in fact, emit more than 500 pounds on each of six occasions. The installation workers performed the surface coating operations at high emission rates to meet the requirements of the Operation Desert Storm mission. The applicable law requires the use of "compliant coatings" with a lower VOC content, or the use of vapor recovery/emission control techniques.

*Reason for violation* — This EA addressed VOC emission violations at a specific building at the installation. The installation received the EA in connection with a mission-essential project for Operation Desert Storm. The installation personnel knew they would exceed the VOC emissions limits because, at the time, no other coating was available that would meet the needs of the mission. Before beginning the project, the installation personnel notified the regulators that the project was a mission-essential job, that no alternative coatings were available, and that VOC emissions limits would probably be exceeded. The installation agreed to install emission control devices in the future and is doing so now. The state issued an EA because it wanted the installation to place its agreement in writing, detailing a plan with set deadlines.

*Summary of underlying cause(s)* — Lack of a technical solution.

## INSTALLATION D (CONTINUED)

### EA #2

**EA DESCRIPTION — EXCEEDED DISCHARGE LIMIT FOR VOLATILE ORGANIC COMPOUNDS (VOCs) ON FOUR DIFFERENT OCCASIONS.**

*Narrative* — The installation failed to meet the VOC emission standard of a maximum of 500 pounds per day and 50 tons per year for all sources. The installation operations violated the standard on 4 days. The standard requires the use of "approved coatings" or the implementation of a vapor recovery or an emission control technology. The installation is currently investigating the following emission reduction measures:

- ◆ use of "compliant coatings";
- ◆ reclassification of selected sources;
- ◆ regulatory changes to include a "bubble policy";
- ◆ implementation of add-on emission controls;
- ◆ reduction of nonessential painting; and
- ◆ use of high-volume, low-pressure spray application techniques.

*Reason for violation* — This EA was issued in conjunction with EA #1 but addressed other violations throughout the depot. The installation received the EA in connection with a mission-essential project for Operation Desert Storm. The installation personnel knew they would exceed the VOC emissions limits because, at the time, no coating was available that would meet the needs of the mission. Before beginning the project, the installation personnel notified the regulators that the project was a mission-essential job, that no alternative coatings were available, and that VOC emissions limits would probably be exceeded. The installation agreed to install emission control devices in the future and is doing so now. The state issued an EA because it wanted the installation to place its agreement in writing, detailing a plan with set deadlines.

*Summary of underlying cause(s)* — Lack of a technical solution.

## INSTALLATION D (CONTINUED)

### EA #3

#### EA DESCRIPTION — EXCEEDED OPACITY LIMIT AT BOILER.

*Narrative* — The installation received an EA for violating opacity standards for stationary sources. The boiler produced emissions that exceeded opacity standards. The regulators observed emissions of an opacity of 30 percent. Opacity emissions resulted from the installation's failure to operate the boiler in accordance with the Operating Plan, which is part of the approved Operating Permit. Excessive opacity occurred due to malfunction of fuel-air mixture equipment. The installation replaced the equipment.

*Reason for violation* — Malfunctioning equipment caused the boiler to exceed opacity standards. The installation's boilers were old, used an obsolete technology, and needed to be upgraded. The old boilers were not capable of indicating opacity levels. The installation obtained new, technically advanced boilers that are capable of indicating whether opacity limits are being exceeded so that installation personnel may attend to the problem.

*Summary of underlying cause(s)* — Equipment failure/obsolescence.

# INSTALLATION E

## EA #1

EA DESCRIPTION — COMMENCED CONSTRUCTION OPERATIONS PRIOR TO BEING PERMITTED.

*Narrative* — The installation began a construction project without obtaining prior permit approval.

*Reason for violation* — The Corps of Engineers (COE) constructed a facility without first obtaining a permit. The COE did not tell the installation personnel that a permit was required and did not give the installation any further information about their project.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

## INSTALLATION E (CONTINUED)

### EA #2

EA DESCRIPTION (FINDING #1) — EXCEEDED VOLATILE ORGANIC COMPOUND (VOC) LIMITATIONS FOR LACQUER SPECIFIED IN REGULATIONS.

EA DESCRIPTION (FINDING #2) — EXCEEDED VOC LIMITATIONS FOR BULLET TIP LACQUER IN PERMIT.

*Narrative* — Installation personnel failed to comply with the provisions of the law governing the VOC content of metals surface coatings. Specifically, workers used lacquer containing 5.41 pounds of VOCs per gallon, whereas the regulations require use of coatings that have less than 5.21 pounds of VOCs per gallon.

*Reason for violation* — The EA resulted from a misunderstanding and state error. The installation submitted an application for a permit and one of the installation's personnel signed the permit, without inspecting it carefully. Later the regulator-auditor questioned the permit and the same staff member signed the EA indicating noncompliance with VOC emissions standards. While the installation did have a permit, the conditions specified in the permit were incorrect. In its application, the installation had requested the correct conditions; these were not reflected in the permit. The installation environmental office should not have accepted the permit but should have requested a correction.

#### *Summary of underlying cause(s)*

- ◆ Lack of management attention/poor supervision
- ◆ Regulator error/confusion.

## INSTALLATION E (CONTINUED)

### EA #3

**EA DESCRIPTION — FAILURE TO TRAIN OPERATOR OF SOLVENT METAL DEGREASERS.**

*Narrative* — The operators of solvent metal degreasers must attend mandatory training sessions in accordance with state law. The installation environmental office did not maintain records of training attendance.

*Reason for violation* — One new employee was overlooked and did not receive adequate training.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

# INSTALLATION F

## EA #1

### EA DESCRIPTION (FINDING #1) — VOLATILE ORGANIC COMPOUND (VOC) EXCEEDANCE AT PAINT SHOP.

*Narrative* — The primer used at the "Y" line contained VOCs in excess of the state requirement of 3.5 pounds per gallon. The regulators issued a citation for failure to comply with VOC emission standards.

*Reason for violation* — The installation used a two-part epoxy primer to coat ammunition parts. A government mandate, in the form of a military specification (MILSPEC), dictated the type of primer to use. After the government issued the mil spec, it altered the MILSPEC, providing an *option* to use a primer producing lower VOC emissions. The installation personnel were not initially aware of the option. After discovering the option, the installation personnel performed accelerated weather testing with the alternative primer to ensure that it met the government requirements. Finding that it did, the installation personnel switched to using the alternative primer after the Army approved its use.

#### *Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

### EA DESCRIPTION (FINDING #2) — FAILURE TO USE AND DILIGENTLY MAINTAIN AIR CONTROL FACILITIES.

*Narrative* — The Hoffman filter system, which was inoperative at the time, controls particulate emissions from the spray finishing processes. The regulators issued a citation for failure to maintain pollution abatement equipment.

*Reason for violation* — The Hoffman filter is a moving fabric filter that receives wash-water from the air scrubber. The filter mechanism includes an automatic level indicator which, when the water reaches a certain level, shuts off the Hoffman filter and activates an alarm. A mechanical failure caused the automatic level indicator to fail to shut off the Hoffman filter when the water attained the critical level. Installation personnel do not know why the automatic level indicator failed and suspect that a blown fuse may have been to blame. No forewarning occurred to indicate that the automatic level indicator had malfunctioned. The Hoffman filter continued to take on water without filtering it and subsequently overflowed. The Hoffman filter was repaired the same day it malfunctioned, and the personnel installed an additional alarm that will notify personnel when the automatic level indicator malfunctions.

*Summary of underlying cause(s)* — Equipment failure/obsolescence.



# INSTALLATION G

## EA #1

EA DESCRIPTION (FINDING #1) — FAILURE TO DISPOSE OF ASBESTOS-CONTAINING MATERIALS (ACM) PROPERLY.

EA DESCRIPTION (FINDING #2) — FAILURE TO NOTIFY REGULATORY AUTHORITY ADMINISTRATOR OF INTENTIONS DURING REMOVAL OF ACM.

*Narrative* — The EA involved failure to meet asbestos NESHAPs and cited two deficiencies. The installation undertook an asbestos abatement project. During the asbestos removal operation, workers did not properly wet the ACM and did not properly dispose of the ACM.

*Reason for violation* — The installation hired a contractor to perform roofing work. The contract specified that if the contractor found excess roofing material on the roof, the contractor could take out the excess and dispose of it. The contractor hired a subcontractor who was unaware of the fact that the old roofing contained asbestos. The subcontractor also did not have training in identifying ACM and did not have the necessary experience to know how to deal with ACM upon discovering them. The subcontractor found asbestos on some pipes, cut the pipes, and threw them to the ground below. The installation received an EA as a result of the subcontractor's actions.

### *Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Lack of environmental knowledge.

## INSTALLATION G (CONTINUED)

### EA #2

EA DESCRIPTION — FAILURE TO LABEL BAG CONTAINING ACM (ASBESTOS-CONTAINING MATERIALS).

*Narrative* — The installation failed to comply with the asbestos NESHAPs. Specifically, the waste asbestos containers were not properly labeled prior to disposal at an approved site.

*Reason for violation* — The contractor disposed of the ACM properly, wetting them thoroughly. However, because the bags containing the asbestos were so thoroughly wetted, two or three adhesive labels fell off the bags and adhered to other bags or were lost. The contractor discovered the problem upon arrival at the disposal site, where the regulator issued an EA.

*Summary of underlying cause(s)* — Contract problem.

# Installation H

## EA #1

### EA DESCRIPTION — STACK EMISSIONS EXCEEDED STANDARDS.

*Narrative* — The installation's heat-recovery incinerator exceeded the permitted emission standards for mercury. An emission test indicated emissions of 0.118, 0.0081, and 0.0049 pounds per hour, whereas the standard requires no more than 0.0009 pounds per hour.

*Reason for violation* — The installation is a relatively old one, having been built just after World War II. The installation has been having trouble with this particular facility ever since it was built. The facility has never been able to meet the state's standards, which are much stricter than the standards of most other states. The installation periodically negotiates with the state regarding emissions and sets milestones. However, each time the installation meets a milestone, the state raises the standards and the installation finds itself in violation. The installation lacks funding to replace the facility.

#### *Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of resources/funding.

## INSTALLATION H (CONTINUED)

### EA #2

EA DESCRIPTION — ALTERED OIL FIRE BURNERS WITHOUT PERMIT.

*Narrative* — The installation failed to obtain a permit to modify the existing boilers. Two boilers were vented to a common stack; two single boilers were also modified. The installation's environmental office did not request or receive permits from the regulator prior to making the modifications and placing the modified units in service.

*Reason for violation* — Because of the length of time that has passed since the EA was issued and because of staffing turnover at the installation's environmental office, no information is available about the circumstances surrounding the underlying reasons for this EA.

*Summary of underlying cause(s)* — Miscellaneous (unknown).

## INSTALLATION H (CONTINUED)

### EA #3

EA DESCRIPTION (FINDING #1) — OPERATED STAGE II VAPOR-RECOVERY SYSTEM WITHOUT A CERTIFICATE.

EA DESCRIPTION (FINDING #2) — FAILURE TO OBTAIN A PERMIT FOR THE CONSTRUCTION/MODIFICATION OF FACILITIES PRIOR TO PLACING FACILITIES INTO OPERATION.

*Narrative* — The installation operated gasoline vapor-recovery control units without the proper permits. Six 10,000-gallon gasoline storage tanks were fitted with vapor recovery equipment and placed in operation. The installation's environmental office did not request or receive a permit for modified facilities prior to placing the units in operation. Also, a Stage II vapor-recovery system with 48 gasoline dispensing nozzles was placed into service prior to requesting and obtaining the required permits.

*Reason for violation* — Because of the length of time that has passed since the EA was issued and because of staffing turnover at the installation's environmental office, no information is available about the circumstances surrounding the underlying reasons for this EA.

*Summary of underlying cause(s)* — Miscellaneous (unknown).

## Installation H (CONTINUED)

### EA #4

**EA DESCRIPTION — RELEASE OF UNPERMITTED SMOKE INTO OUTDOOR AIR FROM COMBUSTION IN STATIONARY INDIRECT HEAT EXCHANGER.**

*Narrative* — An old, inefficient boiler was used as a backup for the main boiler. The opacity meters at the facility were inoperative. When boiler emissions exceeded standards, no alarms sounded and the emissions continued to exceed standards.

*Reason for violation* — The equipment in place was too old to meet the new standards set by the state. The operators should have brought the matter to the attention of management, but did not, probably because of a lack of training or knowledge.

*Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

## Installation H (CONTINUED)

### EA #5

**EA DESCRIPTION (FINDING #1) — RELEASE OF UNPERMITTED SMOKE INTO THE OUTDOOR AIR FROM THE COMBUSTION OF FUEL IN HEAT EXCHANGER.**

**EA DESCRIPTION (FINDING #2) — RELEASE OF SMOKE INTO THE AIR FROM STATIONARY INDIRECT HEAT EXCHANGER.**

*Narrative* — An old, inefficient boiler was used as a backup for the main boiler. The opacity meters at the facility were inoperative. When boiler emissions exceeded standards, no alarms sounded and the emissions continued to exceed standards.

*Reason for violation* — The equipment in place was too old to meet the new standards set by the state. The operators should have brought the matter to the attention of management, but did not, probably because of a lack of training or knowledge.

*Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

## INSTALLATION H (CONTINUED)

### EA #6

**EA DESCRIPTION — ALLOWED SMOKE INTO OUTDOOR AIR FROM STATIONARY INDIRECT HEAT EXCHANGER COMBUSTION.**

*Narrative* — The emissions from the boiler exceeded opacity standards. The boiler stack is equipped with opacity meters that sound an alarm when standards are exceeded. The opacity meters did not operate properly and the fuel/air mixtures were not corrected; hence, the opacity standards were exceeded.

*Reason for violation* — The equipment in place was too old to meet new standards set by the state. The operator should have brought the matter to the attention of management, but did not, probably because of a lack of training or knowledge.

*Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.



## INSTALLATION H (CONTINUED)

### EA #7

EA DESCRIPTION (FINDING #1) — EXCEEDED EMISSIONS LIMIT FOR MERCURY FOR FIRST UNIT.

EA DESCRIPTION (FINDING #2) — EXCEEDED EMISSIONS LIMIT FOR MERCURY FOR SECOND UNIT.

*Narrative* — Installation facilities failed to meet emission standards for mercury. The resource recovery facility units exceeded the permitted emission standards of 0.0009 pounds per hour. The recorded emission rates were as follows:

1. First unit: on six different days, the average emission rate was 0.00403 pounds per hour.
2. Second unit: on six different days, the average emission rate was 0.00441 pounds per hour.

*Reason for violation* — The installation is a relatively old one, having been built just after World War II. The installation has been having trouble with this particular facility ever since it was built. The facility has never been able to meet the state's standards, which are much stricter than the standards of most other states. The installation periodically negotiates with the state regarding emissions and sets milestones. However, each time the installation meets a milestone, the state raises the standards and the installation finds itself in violation. The installation lacks funding to replace the facility.

#### *Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of resources/funding.

# INSTALLATION I

## EA #1

**EA DESCRIPTION — FAILURE TO OBTAIN PERMIT FOR DISPENSING GAS WITHOUT A PHASE II VAPOR-RECOVERY SYSTEM.**

*Narrative* — The installation's environmental personnel failed to obtain a permit from the regulators and dispensed gasoline from the post exchange after 19 June 1990 without a Phase II vapor-recovery system.

*Reason for violation* — The installation's environmental office did not have sufficient resources to hire qualified personnel and, consequently, had to hire unqualified people. The installation was not able to train the new staff in time to avoid the EA.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

## INSTALLATION I (CONTINUED)

### EA #2

#### EA DESCRIPTION — FAILURE TO PAY FINES FOR EA.

*Narrative* — The installation received an EA for failure to pay fines levied for prior EAs.

*Reason for violation* — Coordination and cooperation is weak between the installation and DoD, and between the installation's Directorate of Engineering and Housing (DEH) and Finance Office. DoD has no procedures for paying fines and provides no guidance regarding fines that are the responsibility of a particular installation. When the installation does pay a fine, it has no local procedures to follow for paying the fine. The regulators do not give the installation an invoice for fines, while the installation's Finance Office refuses to pay fines unless it receives an invoice. As a consequence, the installation does not pay fines on time and the regulators issue EAs.

*Summary of underlying cause(s)* — Lack of management attention/poor supervision.

# INSTALLATION I (CONTINUED)

## EA #3

### EA DESCRIPTION (FINDING #1) — FAILURE TO PAY FEE REQUIRED FOR TOXIC HOT SPOTS PROGRAM.

*Narrative* — The installation failed to pay in a timely manner the fees for the "toxic hot spots" program.

*Reason for violation* — Coordination and cooperation is weak between the installation and DoD and between the installation's DEH and Finance Office. DoD has no procedures for paying fees and provides no guidance regarding fees that are the responsibility of a particular installation. When the installation does pay a fee, it has no local procedures to follow for paying the fee. The regulators do not give the installation an invoice for fees, while the installation's Finance Office refuses to pay fees unless it receives an invoice. As a consequence, the installation does not pay fees on time and the regulators issue EAs.

*Summary of underlying cause(s)* — Lack of management attention/poor supervision.

### EA DESCRIPTION (FINDING #2) — FAILURE TO SUBMIT THE CRITERIA POLLUTANT INVENTORY REQUIRED UNDER THE TOXIC HOT SPOTS PROGRAM.

*Narrative* — The installation failed to submit on or before the due date the "criteria pollutant inventory" that is required under the "toxic hot spots" program.

*Reason for violation* — The installation does not have enough staff members to keep track of all the environmental programs and requirements. Moreover, the installation does not have the resources to hire more staff. As a result, the environmental office staff were not aware of the requirements of the program and failed to comply in a timely manner.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

## INSTALLATION I (CONTINUED)

### EA #4

**EA DESCRIPTION — OPERATING EQUIPMENT WITHOUT FIRST OBTAINING A PERMIT.**

*Narrative* — The installation's environmental office failed to pay a recurring fee to maintain its operating permits for air pollution sources at the installation.

*Reason for violation* — Coordination and cooperation is weak between the installation and DoD and between the installation's DEH and the Finance Office. DoD has no procedures for paying fees and provides no guidance regarding fees that are the responsibility of a particular installation. When the installation does pay a fee, it has no local procedures to follow for paying the fee. The regulators do not give the installation an invoice for fees, while the installation's Finance Office refuses to pay fees unless it receives an invoice. As a consequence, the installation does not pay fees on time and the regulators issue EAs.

*Summary of underlying cause(s)* — Lack of management attention/poor supervision.

## INSTALLATION I (CONTINUED)

### EA #5

**EA DESCRIPTION (FINDING #1) — DISTANCE FROM COAXIAL FILL TUBE TO BOTTOM OF FUEL TANK WAS GREATER THAN SIX INCHES.**

*Narrative* — The installation was using an improper fuel tank vapor control device. The distance from the end of the fill tube to the bottom of the fuel tank was greater than six inches. The regulators indicated that this was a repeat finding.

*Reason for violation* — The installation received this EA as a result of a lack of support from the base operations contractor. The installation was aware of the problem and asked the contractor to correct it. The contractor did not correct the problem in time and the regulators issued an EA.

*Summary of underlying cause(s)* — Contract problem.

**EA DESCRIPTION (FINDING #2) — METHANE FLARE NOT OPERATED ACCORDING TO PERMIT.**

**EA DESCRIPTION (FINDING #3) — FAILURE TO MAINTAIN MAINTENANCE REPAIR RECORDS.**

**EA DESCRIPTION (FINDING #4) — METHANE VENTED TO ATMOSPHERE CONTRARY TO PERMITTED ACTIVITIES.**

*Narrative* — The installation operators failed to operate the methane flare in accordance with permit conditions and manufacturer's guidance. The installation's environmental office did not maintain records of repair and maintenance activities as required by the permit. Methane gas was vented directly from the top of the anaerobic digester in violation of permit conditions. Because each of these three findings was noted during previous state inspections and was not corrected before the reinspection, the state regulators issued an EA.

*Reason for violation* — The contractor who operates the facility did not take steps to correct the problem when it was first discovered. The regulators therefore issued the EA.

*Summary of underlying cause(s)* — Contract problem.

**EA DESCRIPTION (FINDING #5) — NO VAPOR-RECOVERY SYSTEM ON GAS TANK GREATER THAN 250 GALLONS IN SIZE.**

*Narrative* — The installation failed to install a vapor-recovery device on a fuel tank with a capacity greater than 250 gallons.

*Reason for violation* — The fuel tanks are part of a Directorate of Logistics (DOL) facility and it is the DOL's responsibility to comply with environmental regulations and requirements. The DOL failed to comply with requirements and the regulators issued an EA to the installation. The installation environmental manager believes the DOL should have received the EA in this case. Also, the manager believes that the problem could have been avoided if the environmental office had sufficient staff to keep track of environmental regulations and requirements.

*Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Lack of resources/funding.

## INSTALLATION J

### EA #1

#### EA DESCRIPTION — BOILER EXCEEDED OPACITY LIMITS.

*Narrative* — The hospital boiler failed to meet opacity standards. Opacity on the day of inspection exceeded 60 percent, which is well in excess of the permit standard. The inspector indicated that this was a recurring problem and that the current condition had lasted several days.

*Reason for violation* — The hospital boiler is operated by a contractor. The contractor's personnel received inadequate training and did not pay sufficient attention to operations, allowing opacity standards to exceed the permissible limits.

#### *Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Lack of environmental knowledge.



## INSTALLATION J (CONTINUED)

### EA #2

**EA DESCRIPTION — ASBESTOS REMOVAL SHOULD HAVE BEEN COMPLETED ACCORDING TO SCHEDULE.**

*Narrative —* The contractor failed to start an asbestos-abatement project as indicated in the notice of intent letter sent to the state. The regulators cited both the contractor and the installation in the EA.

*Reason for violation —* A contractor is required to notify the state of the day it will begin work on an asbestos-removal project. In this case, the contractor experienced a scheduling problem and did not follow the schedule it set for itself. The installation's environmental personnel could not force the contractor to meet the schedule and, as a result, received an EA.

*Summary of underlying cause(s) —* Contract problem.

## INSTALLATION J (CONTINUED)

### EA #3

**EA DESCRIPTION — FIVE PAINT BOOTHS AND AN ABOVE-GROUND STORAGE TANK WERE CONSTRUCTED WITHOUT AIR PERMITS.**

*Narrative* — The installation failed to obtain permits for air pollution sources. Specifically, the installation's environmental office did not obtain permits for the construction and operation of five paint booths, four of which were built prior to 1984, and one above-ground gasoline tank.

*Reason for violation* — This EA involves the interpretation of the standard embodied in the regulations. The regulations specify that minor source generators do not need to obtain a permit for de minimis air pollution sources. The installation was a minor source generator until 1991, when it became a major source generator. The state determined that the installation should have obtained construction permits for facilities that had already been constructed during the time the installation was an exempt minor source generator. The installation disagreed with the state's interpretation, which required the installation to obtain construction permits after construction completion. The state issued an EA nonetheless. The installation resolved the problem by obtaining permits for the facilities already constructed.

*Summary of underlying cause(s)* — Regulator error/confusion.

# INSTALLATION K

## EA #1

**EA DESCRIPTION — FAILURE TO NOTIFY REGULATORY AUTHORITY ABOUT CHANGE IN START DATE.**

*Narrative* — The contractor failed to notify the regulators of a change in the start date for an asbestos-removal project.

*Reason for violation* — The contractor did not begin the asbestos work when it intended to and failed to notify the regulators of this change in plans. The regulators arrived on the day the project was supposed to be completed and found that the contractor was only beginning the work.

*Summary of underlying cause(s)* — Contract problem.

## INSTALLATION K (CONTINUED)

### EA #2

EA DESCRIPTION (FINDING #1) — CONTRACTOR FAILED TO OBTAIN PERMIT.

EA DESCRIPTION (FINDING #2) — CONTRACTOR FAILED TO NOTIFY OCCUPANTS.

*Narrative* — The asbestos-abatement contractor was under contract to the installation to complete an asbestos removal project at installation facilities in the city. The contractor did not receive a permit to perform the work and failed to notify the city of the removal project.

*Reason for violation* — The contractor knew it needed to obtain a permit from the city for performing asbestos work within the city but failed to obtain one. The contractor thought it might be able to escape the requirement, reasoning that, since it already had a Federal permit and since the installation is a Federal facility, a Federal permit would be sufficient. As a result of the contractor's flawed reasoning, the city issued an EA.

*Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Lack of environmental knowledge.

# INSTALLATION L

## EA #1

### EA DESCRIPTION — UNAUTHORIZED MODIFICATION OF BOILER.

*Narrative* — The installation workers failed to obtain a permit to modify an existing boiler. The workers also operated the boiler without the required permit.

*Reason for violation* — The EA resulted from a lack of knowledge of standard operating procedures, specifically an incorrect interpretation of a rule. Installation personnel replaced the boiler burners with the exact same kind of burners without obtaining a permit. The personnel assumed that, because the replacement burners matched the existing burners exactly, a permit was not required. However, the requirement for a permit was triggered because the burners' serial numbers changed when the burners were replaced.

*Summary of underlying cause(s)* — Lack of environmental knowledge.

## INSTALLATION L (CONTINUED)

### EA #2

**EA DESCRIPTION — MODIFICATION OF PERMIT TO OPERATE THREE BOILERS WITHOUT AN AUTHORIZATION TO CONSTRUCT.**

*Narrative* — The installation received an EA listing three counts of failure to notify the regulator and have the existing operating permit modified prior to conducting operations of three modified boilers.

*Reason for violation* — Communication between the installation's shop workers and the environmental office personnel was poor. The shop workers were unaware of the need for prior authorization to disconnect the boilers. The workers removed the boilers' diesel backup firing capabilities without obtaining a permit. Because the shop workers neglected to apply for a modification permit, the boilers' previous exemption was canceled and the installation received an EA.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

## INSTALLATION L (CONTINUED)

### EA #3

**EA DESCRIPTION — FAILURE TO SUBMIT PERMIT APPLICATION FOR GAS BOILER.**

*Narrative* — The installation's environmental personnel failed to obtain a permit to operate the gas boiler.

*Reason for violation* — Because of the length of time that has passed since the EA was issued and because of staffing turnover at the installation's environmental office, no information is available about the circumstances surrounding the underlying reasons for this EA.

*Summary of underlying cause(s)* — Miscellaneous (unknown).

# INSTALLATION M

## EA #1

EA DESCRIPTION (FINDING #1) — CONTAMINATED WASTE INCINERATOR OUT OF COMPLIANCE WITH PERFORMANCE EVALUATION PERMIT.

EA DESCRIPTION (FINDING #2) — EXCEEDED PARTICULATE MATTER EMISSIONS LIMITATION.

*Narrative* — The installation's contaminated waste incinerator failed to meet permit emission limits. The EA listed two findings: The first finding indicated a failure to come into compliance with permit conditions after a year of being out of compliance. This violation was cited because the state felt the installation had more than enough time to come into compliance. The second finding indicated a failure to meet the permit emission standards for particulates. This violation resulted from more recent testing.

*Reason for violation* — With regard to the first finding, for reasons unknown (because of staff turnover at the environmental office and the length of time that had passed since the EA was issued), the contaminated waste incinerator had never been tested since going on-line in 1982 or 1983. The data reflected in the original permit were supplied by the vendor. Approximately 8 years later, the installation tested the contaminated waste incinerator for the first time. The incinerator did not meet the standards reflected in the vendor data and failed the test. Therefore, the state issued an EA. The second finding was because of the condition of the scrubber. The installation's personnel cleaned the scrubber and the incinerator later passed the test.

*Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of management attention/poor supervision.



# INSTALLATION N

## EA #1

EA DESCRIPTION (FINDING #1) — FAILURE TO PROVIDE 3-DAY NOTIFICATION TO REGULATORY AUTHORITIES PRIOR TO COMMENCING ASBESTOS REMOVAL.

EA DESCRIPTION (FINDING #2) — FAILURE TO MAINTAIN FRIABLE ASBESTOS-CONTAINING MATERIALS (FACM) IN WETTED CONDITION DURING STRIPPING OR REMOVAL.

EA DESCRIPTION (FINDING #3) — FAILURE TO ISOLATE BY BARRIER AND MAINTAIN NEGATIVE AIR PRESSURE.

EA DESCRIPTION (FINDING #4) — FAILURE TO MAINTAIN FACM IN WETTED CONDITION WHILE HANDLING AND STORING.

EA DESCRIPTION (FINDING #5) — FAILURE TO PREVENT VISIBLE EMISSIONS TO THE AIR DURING COLLECTION, PROCESSING, AND DISPOSAL.

EA DESCRIPTION (FINDING #6) — FAILURE TO SEAL FACM INTO LEAK-TIGHT CONTAINERS.

*Narrative* — The regulators issued an EA with six findings for failure to comply with asbestos regulations. This was a contractor operation, and the contractor simply did not meet the standards required by the contract and the law. The contractor failed to notify the regulators 3 days prior to starting the asbestos removal work. The contractor also failed to keep friable asbestos-containing materials (FACM) wetted during removal, handling, and transport. The removal area was not isolated and maintained under negative pressure. Also, the contractor did not control or prevent visible emissions of asbestos during storage, handling, and disposal. Finally, the contractor failed to seal the FACM in airtight containers.

*Reason for violation* — The contractor was hired to remove linoleum tiles. The linoleum was backed with asbestos containing materials. The contractor used incorrect mechanical means, rather than the proper wet method, to remove the tiles, and then threw them into the dumpster. These events happened late at night, on a weekend, when no installation personnel were present to advise the contractor. The contractor lacked experience in asbestos removal operations and was not familiar with the wet method but had to make an on-site decision without guidance. The contractor decided to use an incorrect method, and, as a result, the installation received an EA.

### *Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Lack of environmental knowledge.

## INSTALLATION N (CONTINUED)

### EA #2

#### EA DESCRIPTION — VIOLATION OF PERMIT ON PAINT SPRAY BOOTHS.

*Narrative* — The installation received a notice to correct for failure to comply with the conditions of the operating permit. There are seven permitted spray paint booths at the painting facility. The permit requires the use of high-volume, low-pressure spray guns. Instead, the operators were using conventional spray guns. Because the high-volume, low-pressure spray guns were not being used, the installation violated its permit and received a notice to correct.

*Reason for violation* — The county regulatory authorities never sent the installation updated rule changes. The installation's environmental office received the updated versions several months after the rule changes had taken effect. The spray guns had been able to exceed the previous rules' standards, but the guns were not able to meet the new standards. The installation was still using the conventional spray guns because they did not know they were supposed to change to using high-volume, low-pressure spray guns.

#### *Summary of underlying cause(s)*

- ◆ Equipment failure/obsolescence
- ◆ Lack of environmental knowledge
- ◆ Regulator error/confusion.

# INSTALLATION O

## EA #1

**EA DESCRIPTION — BOILER EMISSIONS TESTING RECORDED A 7 SMOKE SPOT READING USING #2 OIL.**

*Narrative —* The boiler at the facility exceeded emission standards of a 2 smoke spot reading or less. A reading of 7 smoke spot units was recorded during the inspection.

*Reason for violation —* The problem was due to old equipment that needed to be replaced. To correct the problem, installation workers installed a new boiler.

*Summary of underlying cause(s) —* Equipment failure/obsolescence.

# INSTALLATION P

## EA #1

### EA DESCRIPTION — DISPENSING GASOLINE WITHOUT A PERMIT.

*Narrative* — The installation operated a Phase I and II gasoline-dispensing facility without a construction/operating permit. The installation had neglected to request a permit.

*Reason for violation* — Because of the length of time that has passed since the EA was issued and because of staffing turnover at the installation's environmental office, no information is available about the circumstances surrounding the underlying reasons for this EA.

*Summary of underlying cause(s)* — Miscellaneous (unknown).

# INSTALLATION Q

## EA #1

**EA DESCRIPTION — FAILURE TO PERFORM DIESEL VEHICLE EMISSION TESTING AS REQUIRED BY STATE LAW.**

*Narrative* — The installation failed to perform diesel vehicle emission testing as required by state law. Apparently, the requirement was known and attempts to meet it failed when the state would not allow central vehicle emission testing. The installation has purchased equipment which, when in place and operated by a trained staff, will meet testing requirements.

*Reason for violation* — The installation had a low-capacity testing facility and an inadequately trained staff. To overcome these problems, the installation sought to establish a central testing facility. However, it was unable to do so because of the ownership of the vehicles. In order to obtain authorization to operate a central testing facility, only the facility owner's vehicles may be tested at the facility. This was not possible because the vehicles that needed testing belonged to the units to which they were assigned, and many units were involved. The state therefore denied permission to establish a central testing facility. As a result, the installation was unable to perform the testing to the state's satisfaction and the state issued an EA. The installation is now seeking an exemption from the central testing facility ownership requirements.

*Summary of underlying cause(s)*

- ◆ Lack of resources/funding
- ◆ Lack of a technical solution.

# INSTALLATION R

## EA #1

**EA DESCRIPTION — FAILURE TO NOTIFY REGULATORY AUTHORITY OF ACM ABATEMENT PROJECT.**

***Narrative*** — The asbestos-abatement contractor started and completed an abatement project before the scheduled project dates. The state was not notified of the change in dates and therefore issued an EA.

***Reason for violation*** — The contractor did not coordinate with the state. The contractor said it was going to start and finish on certain dates and then changed its plans. Apparently, the contractor did not realize that the state might arrive at any time to inspect the work.

***Summary of underlying cause(s)***

- ◆ Contract problem
- ◆ Lack of environmental knowledge.

# INSTALLATION S

## EA #1

**EA DESCRIPTION — FAILURE OF MOLECULAR SIEVE TO MEET THE 90 PERCENT ON-LINE TIME REQUIREMENT OF THE REGULATIONS.**

*Narrative* — The molecular sieves failed to meet design performance standards that require the sieves to be on-line and functional 90 percent of the time.

*Reason for violation* — The equipment is complex and difficult to maintain. However, the contractor managed to meet the requirements after the installation received the EA.

*Summary of underlying cause(s)*

- ◆ Contract problem
- ◆ Equipment failure/obsolescence.

## INSTALLATION S (CONTINUED)

### EA #2

#### EA DESCRIPTION — OPEN BURNING OF PROHIBITED MATERIALS.

*Narrative* — Installation workers burned unauthorized materials at the open burning site. State inspectors found that installation workers had scheduled and were in the process of burning nonexplosive materials, such as wood and paper products, together with explosive and explosive-containing materials at the open burning site.

*Reason for violation* — The materials being burned were timecards from the manufacturing area. Former regulations had specified that materials from the manufacturing area were to be open-burned. New regulations specify that only materials contaminated with propellant should be open-burned. Timecards, which are office supplies, are not contaminated by propellant and must not be open-burned. The installation personnel needed greater awareness of, and training in, the new requirements.

*Summary of underlying cause(s)* — Lack of environmental knowledge.



# INSTALLATION T

## EA #1

### EA DESCRIPTION — EXCEEDED SULFUR DIOXIDE LIMITATIONS.

*Narrative* — The installation failed to have its construction/alteration permit approved prior to constructing and operating two new boilers in the Thiokol area of the plant. These boilers may exceed sulfur dioxide emission levels and may not meet the required best available control technology requirements.

*Reason for violation* — The problem occurred at a contractor-operated, government-owned facility. The contractor replaced the boilers and did not inform the installation's environmental office. The boilers were small, with a capacity of approximately 10 million Btus per hour. This type of boiler used to be exempt from permit requirements. In 1991, new Federal regulations called for permits for boilers of this size. The contractor replaced the old boilers with identical new boilers. When installation personnel discovered that the contractor had installed new boilers, they called the state and learned that the new boilers needed permits.

*Summary of underlying cause(s)* — Contract problem.

# INSTALLATION U

## EA #1

**EA DESCRIPTION — FAILURE TO ADHERE TO DAILY THROUGHPUT LIMITS ON PATHOLOGICAL WASTE INCINERATOR.**

*Narrative* — The installation's pathological waste incinerator permit limits throughput to 540 pounds per day. The installation's records indicated that more than 700 pounds were through-put in one day. In addition, the installation failed to maintain adequate records of through put.

*Reason for violation* — Inadequate supervision and training of hospital employees caused the situation that led to the EA. The hospital employees were pressed for time and allowed too much waste to accumulate. The employees then through-put this waste all at once, exceeding the permit limits. The installation corrected the problem by advising the hospital to train and supervise its employees.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision.

# INSTALLATION U

## EA #2

### EA DESCRIPTION (FINDING #1) — OPERATING A GAS STATION WITHOUT A VAPOR-RECOVERY SYSTEM.

*Narrative* — The installation failed to equip the military gasoline station with Stage I vapor-recovery systems. Personnel were confused about the date on or before which the installation needed to install Stage I vapor-recovery systems. The installation's environmental personnel thought Stage I vapor-recovery systems could be installed by 1999, whereas the state felt the systems were due in 1992.

*Reason for violation* — The Judge Advocate General (JAG) officer-attorney and the state disagreed over interpretation of the regulations. The problem occurred as a result of failure to read regulatory minutiae; this in turn was caused by understaffing. This installation does not have the resources to hire additional environmental staff to track all the changes in the regulations.

#### *Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

### EA DESCRIPTION (FINDING #2) — FAILURE TO OBTAIN PERMIT PRIOR TO INSTALLATION OF BOILERS.

*Narrative* — The installation failed to obtain permits prior to installing two new boilers at the post hospital. The environmental office managers initially felt that the boilers did not need permits because the boilers operated on natural gas more than 95 percent of the time and had a capacity below the regulated Btu limits.

*Reason for violation* — The installation's JAG officer-attorney disagreed with the state about interpretation of the regulations. The problem occurred as a result of failure to read regulatory minutiae; this in turn was caused by understaffing. The boiler replacement project was started 3 years ago when the installation was small. The installation's environmental managers were unaware of the exact specifications for boilers and did not realize that the boilers were no longer exempt once their capacity exceeded 10 million Btus. To correct the situation, the installation engineer obtained permits for all the installation boilers.

*Summary of underlying cause(s)*

- ◆ Lack of environmental knowledge
- ◆ Lack of resources/funding.

# INSTALLATION V

## EA #1

**EA DESCRIPTION — FAILURE TO NOTIFY AGENCY WITHIN 10 DAYS OF DESTRUCTION OF BUILDING WITH ASBESTOS-CONTAINING MATERIALS (ACM).**

***Narrative*** — The installation failed to notify the state of the demolition of a facility that had asbestos-containing materials.

***Reason for violation*** — The facilities were being demolished by military troops. The troops were supposed to remove recyclables (such as sinks) after all ACM were removed. However, due to lack of coordination with other installation offices, the troops received orders to remove the recyclables before all ACM had been removed. The troops' activities opened up the walls and exposed pipes containing asbestos. The installation environmental personnel were overworked and did not have sufficient resources to coordinate with other offices.

***Summary of underlying cause(s)***

- ◆ Lack of environmental knowledge
- ◆ Lack of management attention/poor supervision
- ◆ Lack of resources/funding.

## APPENDIX D

# Enforcement Action Reason and Corrective Action Codes

# Enforcement Action Reason and Corrective Action Codes<sup>1</sup>

**Table D-1.**  
**Reason Code Definitions**

Code	Code definition
10	EXCEEDANCES
11	Volatile organic compounds (VOCs)
12	Visible
13	SDWA and drinking water standards
14	Required notifications
15	Inadequate levels of . . .
16	NPDES and pretreatment limits
17	Emission limits, fuel use, miscellaneous
18	Unauthorized use of . . .
19	Unreported exceedances
20	TECHNICAL WORK
21	Sampling, analysis, monitoring errors/failures
22	Calibration problems
23	Lab errors/failures/certification requirements
30	PERSONNEL ISSUES
31	Uncertified personnel
32	Inadequate supervision certification
33	Training: inadequate/not done
34	Operator training (not environmental staff)
35	Inadequate number of personnel

*Note:* SDWA = Safe Drinking Water Act; NPDES = National Pollutant Discharge Elimination System; O&M = operations and maintenance; LDR = land disposal restriction; UST = underground storage tank.

<sup>1</sup>LMI Report AR202RD4, *Deriving Management Information from Environmental Notices of Violation*, Douglas M. Brown, H. Locke Hassrick, and Robert J. Baxter, October 1992.

**Table D-1.**  
**Reason Code Definitions (Continued)**

Code	Code definition
40	OPERATIONS
41	Unpermitted/unauthorized/unregistered activity/equipment
42	Records/files data submissions (incomplete/late)
43	Labeling/placard deficiencies
44	Storage/accumulation issues (time, volume)
45	General O&M failures
46	Faulty/missing equipment
47	Manifest/transport problems, LDR certification
48	Nonlisted/restricted wastes activities
49	Inspections/engineering certification
50	SPILLS/LEAKS/DISCHARGES
51	Unauthorized discharge/disposal
52	Leak/spill from container/UST
53	Bypass or overflow
54	Contamination from spill/leak/discharge — not cleaned up
55	Procedural error causing spill or pollution
56	Not used
57	Spill, etc., not reported
60	FACILITIES PROBLEMS
61	Facility design or capabilities
62	Monitoring/detection/control systems
63	Hazardous waste treatment, storage, or disposal
64	Underground storage tanks
70	GENERAL MANAGEMENT
71	Reports
72	Security and safety
73	Forms, documents, plans, manuals, procedures — inadequate/incomplete (but not operating records, covered under code 42)
74	Fees not paid
75	Failure to respond to regulatory authority notice

**Note:** SDWA = Safe Drinking Water Act; NPDES = National Pollutant Discharge Elimination System; O&M = operations and maintenance; LDR = land disposal restriction; UST = underground storage tank.



**Table D-1.**  
**Reason Code Definitions (Continued)**

Code	Code definition
80	LEGAL AGREEMENTS (AND OTHER LEGAL OBLIGATIONS)
81	Not in accordance with (IAW) compliance agreement
82	Late in achieving compliance agreement milestone
83	Not IAW closure plans
84	Late with closure milestones
85	Not IAW permit/plan/schedule/other legal requirements
86	Late with permit/plan/schedule/other milestone

**Note:** SDWA = Safe Drinking Water Act; NPDES = National Pollutant Discharge Elimination System; O&M = operations and maintenance; LDR = land disposal restriction; UST = underground storage tank.

## DETAILED DEFINITIONS OF REASON CODES

10. **EXCEEDANCES**
11. *Volatile organic compounds (VOCs)* – Violation of permit conditions or regulation/statute limiting VOC emissions.
12. *Visible* – Violation of opacity limits in stationary source exhaust emissions.
13. *Safe Drinking Water Act (SDWA) (and drinking water standards)* – Violations of primary drinking water standard, maximum contaminant levels (MCLs).
14. *Required notifications* – Failure to provide exceedance notifications to the public or regulatory agency where required by permit or regulation/statute. This type of violation is a feature of the SDWA and requires public water system operators to notify customers of MCL violations.
15. *Inadequate levels of . . .* – Failure to maintain mandated chemical concentrations in such facilities as public drinking water systems. This violation occurs under the SDWA when required levels of disinfectants such as chlorine are not maintained at a residual level necessary to maintain the bacteriological quality requirement. It also includes cases of excessive levels where the requirement establishes an upper limit as well as a lower limit (chlorine being such a case).

16. *National Pollutant Discharge Elimination System (NPDES) and pretreatment limits* – Violations of NPDES permit conditions of pretreatment permit requirements designated by a local, publicly owned treatment works.
17. *Emission limits fuel use miscellaneous* – Violation of contaminant level emission limits established by permit or regulation other than those already noted in this section. This category of exceedance also includes violations of limits on fuel (oil, coal, etc.) quality with respect to sulfur or other constituents set by Federal, state, and local agencies.
18. *Unauthorized use of . . .* – Utilization of surface coatings, thinners, etc. prohibited by permit or regulation.
19. *Unreported exceedances* – Failure to report discharge/emission exceedance to specified regulatory agency as required per permit or regulation.
20. **TECHNICAL WORK**
21. *Sampling, analysis, monitoring errors/failures* – Failure to perform sampling, analysis, and monitoring in accordance with prescribed procedures or permit criteria for such media as solid waste, air, water, and wastewater. This reason code also includes compliance with monitoring protocol for groundwater monitoring wells, underground storage tanks (USTs), as well as chain-of-custody procedures.
22. *Calibration problems* – Failure to utilize analytical equipment calibrated according to established criteria or failure to conduct required calibrations. Where the deficiency is a failure to maintain the required records, but the calibrations were in fact performed, use code 42.
23. *Lab errors/failures/certification requirements* – Improper laboratory techniques relative to preservation and analysis of samples. This reason code also includes use of an uncertified lab as well as failure of a laboratory to meet state or Federal criteria for sample handling and analysis. Inspection deficiencies relative to standard procedures used by a lab are also included in this violation reason code.
30. **PERSONNEL ISSUES**
31. *Uncertified personnel* – Failure to use personnel certified for specific functions as required by regulatory agencies. Examples include asbestos removal/remediation personnel or wastewater treatment system operators. Inadequate certification records should be coded only 42.
32. *Inadequate supervision certification* – Failure to have properly certified supervision on site for specified operations, e.g., asbestos removal/ remediation, wastewater treatment operations supervision (normally is at least one level of certification higher than supervised personnel operating the wastewater treatment plant).

33. *Training: inadequate/not done* – Failure to train environmental staff personnel in the performance of their duties as specified by applicable Federal/state/local requirements. This reason code also includes inadequate training, or failure to conduct annual refresher training. Lack of training records should use code 42; failure to have certification training, resulting in uncertified personnel, should use code 31.
34. *Operator Training (Not environmental staff)* – Failure to train personnel outside of environmental staff organization. This may include Defense Reutilization and Marketing Office or other personnel handling hazardous wastes or Directorate of Engineering and Housing personnel in waste or water treatment plants, landfills, etc.
35. *Inadequate number of personnel* – Failure to provide personnel in sufficient quantity so as to comply with permit conditions for an operation such as a sanitary landfill. State regulations may also set personnel requirements for other operations subject to environmental regulation.
40. **OPERATIONS**
41. *Unpermitted/unauthorized/unregistered activity or equipment* – This reason code includes such violations as failure to obtain permits for equipment or operations such as boilers, paint spray booths, asbestos removal operations, and discharge of a pollutant as well as operations not identified in permit applications such as the Resources Conservation and Recovery Act (RCRA) "A" permit. The prime focus of this reason code is on operations for which a construction and/or operating permit or registration was not obtained for a unit currently in operation. Also see code 51.
42. *Records/files/data submissions (incomplete/late)* – This code provides for violations concerning operating records, files, etc., not maintained in accordance with regulations, to include incomplete or late submittals. Examples of recordkeeping requirements subject to this code include maintaining manifest copies, land disposal restriction (LDR) certifications, operating records of open burning/open detonation and other treatment/disposal operations, inspection logs, polychlorinated biphenyl (PCB) item inspection records, training records, etc. Discharge monitoring reports (DMRs) are also subject to this reason code.
43. *Labeling/placard deficiencies* – Included in this reason category are violations of regulations requiring labeling for containers, storage areas, and facility boundaries as well as placard deficiencies for vehicles transporting hazardous waste/materials. Violations include failure to label, improper or inaccurate labeling, no placards on hazardous waste transport vehicles, as well as illegible labeling.
44. *Storage/accumulation issues (time, volume)* – This violation code addresses violations related to storage and/or accumulation of hazardous waste. Typical examples of this violation code include storage beyond permitted

volume or time limits, failure to indicate accumulation or storage start dates on containers, or storage not in accordance with recognized standards for incompatibility.

45. *General operations and maintenance (O&M) failures* – This reason code concerns those violations of an operational and maintenance nature that do not readily meet criteria for classification into alternative codes. Many of these are housekeeping items such as use of defective containers, failure to close hazardous waste (HW) containers, poor/little control at a land-fill, lack of proper aisle space in storage areas (see code 72), as well as lack of maintenance of pollution control equipment (e.g., baghouses).
46. *Faulty/missing equipment* – This reason code is designated for violations resulting from inoperative, poorly designated, or nonexistent equipment needed to meet permit conditions and regulatory requirements or prevent releases of pollutants into the environment.
47. *Manifest/transport problems/land disposal restriction (LDR) certification* – This code provides for violations in which the manifest and/or transportation of hazardous wastes for the purpose of recycling treatment or disposal is not in accordance with regulations. It does not include record-keeping issues (violation code 42), but it does include improper preparation of the manifest. Manifest discrepancies, including LDR certification requirements, as well as transport violations (vehicle not certified for HW transport) are typical of violations to be included in this category.
48. *Nonlisted/restricted wastes activities* – This category of violation is designated for specific hazardous waste stream activities such as generation, storage, and treatment that do not appear on the installation permit, notification of hazardous waste activity forms, or permit applications. For instance, where an installation is storing a waste that is not listed on a Part "A" permit or final permit, the violation would be reason code 48. In addition, when an installation has failed to properly identify and treat restricted wastes as required by regulations, the same reason code would be used.
49. *Inspections/engineering certification* – Violations included within this code result from failure to perform inspections required in permits or by Federal/state/local regulations. This code would also be used for failure to obtain engineering certification of structural integrity/proper system installation prior to use of certain waste management units, such as tanks.
50. *SPILLS/LEAKS/DISCHARGES* – The events classified under these codes should be a significant departure from permitted standards, as opposed to minor daily exceedances envisioned in codes 10 – 19.
51. *Unauthorized discharge/disposal* – This violation code indicates that *discharges* or *disposal* of regulated substances has occurred without proper permits and in violation of Federal, state, or local regulations. Examples

would include discharges to "waters of the U.S." without a permit or failure to properly dispose of materials such as PCBs. Do not include unauthorized emissions from point sources in this category (code 41). The essence of this code is that an entire environmental program is completely unpermitted (e.g., no air permit at all) or that specific discharge occurred. Note that code 41 applies to specific activities or equipment found to be without permits within a generally permitted program.

- 52. *Leak/spill from container/UST* – Leaks, spills, or discharges of hazardous substances from drums, USTs, or other storage vessels into the soil, surface water, or groundwater are the most common violations to be coded in this category.
- 53. *Bypass or overflow* – This code includes cases where the volume of waste overloads the containment system. Violations include bypass of wastewater or industrial waste treatment operations or spills resulting from tank overflow. It also includes "upsets" – temporary failures of equipment that result in excessive discharges for a short period.
- 54. *Contamination from spill/leak/discharge, not cleaned up* – This code is employed for violations resulting from inadequate spill cleanup or remediation as well as failure to respond to spills resulting in contamination of soil and groundwater. The original spills themselves are covered by other codes in this 5x category.
- 55. *Procedural error causing spill or pollution* – Violations coded in this category result from deficient operational procedures that result in soil and/or water contamination. Examples include land management activities that do not allow for erosion control measures or open burning unit operational procedures that fail to prevent contaminant release into adjacent soil or groundwater.
- 56. Not used.
- 57. *Spill, etc., not reported* – This violation reason code primarily refers to spills, releases, etc., that are not reported in a timely manner as defined by regulation. This code overrides all other codes in the 50 series.
- 60. **FACILITIES PROBLEMS**
- 61. *Facility design or capabilities* – This violation reason code encompasses generic design deficiencies for a variety of installation structures, systems, or resources. Included as examples are inadequate cross-connection or backflow prevention systems, inadequate supply of potable water, inefficient sewage treatment systems, and other cases of inadequate capability, capacity, or containment as a result of the facility design. Hazardous waste facilities are covered separately under code 63.

62. *Monitoring/detection/control systems* — This reason code is to be used where systems designed to monitor environmental contamination, provide automatic detection of leaks from units such as USTs, or control liquid levels either have not been installed or are not operating properly. Examples include failure to properly design and install groundwater monitoring wells, failure to maintain erosion control measures, inadequate tank level monitoring system, and failure to install interstitial leak detection system.
63. *Hazardous waste treatment, storage, or disposal* — This reason code applies to design deficiencies for *hazardous waste* treatment, storage, or disposal facilities. This can include tanks, impoundments, storage areas, oil/water separators, etc. The most common violations for this code include lack of secondary containment, structural flaws in storage areas, lack of runoff control for waste piles, or defects in impoundment liners or berms.
64. *Underground storage tank* — UST design deficiencies or operational capability issues are included in this violation reason code. Deficiencies relative to design requirements can be assessed given Federal/state/local regulations for USTs. Common findings include inadequate cathodic protection, lack of overfill protection, failure to provide vapor Phase I or Phase II recovery, and failure to provide pressure testing. Ancillary devices, such as lead detection systems in interstitial spaces should be coded under item 62 (monitoring/detection/control systems). This code (64) pertains primarily to as-built or modified structural items relating to corrosion protection, tank tightness, and fill pipe location, etc.
70. **GENERAL MANAGEMENT**
71. *Reports* — This reason code refers to general failures to submit required reports. These include reports required by Federal/state/local agencies pertaining to RCRA, the Toxic Substances Control Act, the Clean Water Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This should not include individual DMRs that were sent in late or were incomplete, since these reports are sent in frequently enough to indicate an operational deficiency as opposed to general management deficiencies; occasional late or incomplete DMRs belong in reason code 42. However, consistently inadequate DMRs, or outright *failure* to submit DMRs, indicate management deficiencies and as such should be coded as 71. Other report violations to be classified as reason code 71 include failure to comply with public notification requirements, annual PCB reports, annual hazardous waste assessment reports or reports related to groundwater monitoring operations that are part of CERCLA or RCRA corrective action.
72. *Security and safety* — Violation reasons coded no. 72 consist primarily of failure to provide personal protection equipment, equipment to be utilized in response to emergencies and other items related to providing for employee safety and health as detailed in an installation contingency

plan. Other common findings of violations with this code include inadequate aisle space for egress (see code 45), failure to post hazardous waste management areas, and failure to coordinate emergency response plans with local agencies such as police and fire departments.

- 73. *Forms, documents, plans, manuals, procedures, inadequate/incomplete (but not operating records, covered under code 42)* — This reason code covers the failure to submit timely or adequate documentation, plans, procedures, etc., required by regulatory agencies on environmental issues of concern that require agency authorization, oversight, or approval. These documents also describe procedures in effect at an installation designed to ensure compliance with environmental agency regulations. Forms, plans, and documents of consequence per this code include waste analysis plans, contingency plans, closure and post closure plans, parts "A" and "B" permit applications, financial assurance documentation, groundwater sampling plans, asbestos-containing material project notices, waste disposal documentation, spill prevention and control contingency plans, or other documents required in order to be allowed to have a permitted program but not of themselves essential to proper operation of environmental activities. Operating records/plans violations are not to be recorded here (see code 42).
- 74. *Fees not paid* — This reason code identifies violations that are issued solely to document the failure to pay fees such as those required for permits, registration fees (USTs), or HW assessment fees.
- 75. *Failure to respond to regulatory authority notice* — Receipt of a violation due to lack of response to a prior violation notice that required action on the installation's part within a specified period of time.
- 80. **LEGAL AGREEMENTS (AND OTHER LEGAL OBLIGATIONS, PERMITS, AND PLAN REQUIREMENTS)**
- 81. *Not in accordance with (IAW) compliance agreement* — This reason code applies to violations that result from failure to correct a violation in accordance with the dictates of a compliance agreement.
- 82. *Late in achieving compliance agreement milestone* — This reason code applies to violations that result from failure to achieve a milestone per compliance agreement requirements.
- 83. *Not IAW closure plans* — Violations of this type occur when closure of specific operational units and structures is not completed according to closure plan specifications or requirements.
- 84. *Late with closure milestones* — Violations of this type occur when closure of specified operational units and structures is not completed in a timely manner in accordance with milestones in a closure plan.

85. *Not IAW permit/plan/schedule/other legal requirements* — Violations of this type occur when activities are conducted in a manner not in accordance with a permit, plan, or schedule agreed to by an installation and regulatory agency. Exceedances and procedural violations are covered under codes 10 and 40; this code addresses failure to act as agreed by a legal document other than a "compliance agreement."
86. *Late with permit/plan/schedule/other milestones* — Violations of this type occur when projects are not achieved in a timely manner in accordance with milestones in a permit, plan, or schedule agreed to by an installation and regulatory agency.



## APPENDIX E

# Army Installations and Air Quality Attainment Areas

**Table E-1.****Projected National Ambient Air Quality Standards Nonattainment Status for Department of the Army Activities**

Installation name	State	Current MACOM	Class		
			O2	CO	SO2
Florence Military Reservation	AZ	NGB			Primary
Fort Huachuca	AZ	TRADOC			Primary
Defense Depot Region W - Tracy	CA	DLA	Serious		
Defense Depot Region W - Sharpe	CA	DLA	Serious		
Fort Irwin	CA	FORSCOM	Extreme	Serious	
Norwalk Defense Fuel Support Point	CA	DLA	Extreme	Serious	
Riverbank AAP	CA	AMC	Serious		
Sacramento Army Depot	CA	AMC	Serious		
San Pedro Defense Fuel Support Pt.	CA	DLA	Extreme	Serious	
Stockton Defense National Stockpile	CA	DLA	Serious		
Camp George West	CO	NGB	(Trans)		
Fitzsimons Army Medical Center	CO	HSC	(Trans)		
Rocky Mountain Arsenal	CO	AMC	(Trans)		
Camp O'Neill	CT	NGB	Serious		
Stratford Army Engine Plant	CT	AMC	Severe-17		
Fort McNair	DC	MDW	Serious		
Walter Reed AMC	DC	HSC	Serious		
Fort Gillem	GA	FORSCOM	Serious		
Fort McPherson	GA	FORSCOM	Serious		
Fort Sheridan	IL	FORSCOM	Severe-17		
Joliet AAP - Kankakee	IL	AMC	Severe-17		
Fort Benjamin Harrison	IN	TRADOC		(No class)	Primary
Hammond Defense Natl. Stockpile	IN	DLA	Severe-17	(No class)	Primary
Baton Rouge Defense Natl. Stockpile	LA	DLA	Serious		
Gulf Outport	LA	MTMC	(Trans)		
Camp Curtis Guild	MA	NGB	Serious		
Camp Edwards	MA	NGB	Serious		
Fort Devens	MA	FORSCOM		(No class)	
Material & Mechanics Research Ctr.	MA	AMC	Serious		

**Notes:** MACOM = major command; AAP = Army Ammunition Plant; AMC = Army Materiel Command; ARDEC = Armament Research, Development, and Engineering Center; NGB = National Guard Bureau; TRADOC = Training and Doctrine Command; DLA = Defense Logistics Agency; FORSCOM = Forces Command; HSC = Health Services Command; MDW = Military District of Washington; MTMC = Military Traffic Management Command; USMA = U.S. Military Command; TACOM = Transportation and Armaments Command. See Table E-2 for definitions under O2, CO, and SO2 classes.

Blanks under column headings indicate those areas are attainment areas, have not been evaluated, or are moderate or marginal. There were no installations recorded above the median for Particulate with Aerodynamic Diameter <10 microns Class (PM10).

**Table E-1****Projected National Ambient Air Quality Standards Nonattainment  
Status for Department of the Army Activities (Continued)**

Installation name	State	Current MACOM	Class		
			O2	CO	SO2
Natick Res. Dev. & Eng. Center	MA	AMC	Serious		
Aberdeen Proving Ground	MD	AMC	Severe-15		
Harry Diamond Laboratory	MD	AMC	Serious		
Chemical RD&E Center	MD	AMC	Severe-15		
Curtis Bay Defense Natl. Stockpile	MD	DLA	Severe-15		
Fort Detrick	MD	HSC	Serious		
Fort George G. Meade	MD	MDW	Serious		
Gunpowder Military Reservation	MD	NGB	Severe-15		
Lauderick Creek	MD	NGB	Severe-15		
Riley-Bog Brook Training Site	ME	NGB	(No data)		
Michigan Army Missile Plant	MI	AMC		(No class)	
Pontiac Storage Activity	MI	AMC		(No class)	
Selfridge Support Activity	MI	AMC		(No class)	
TACOM Support Activity	MI	NGB		(No class)	
Twin Cities AAP	MN	AMC			Primary
St. Louis/Gateway AAP	MO	NGB		(No class)	
Fort William Henry Harrison	MT	NGB			Primary/Sec
Sommerville Defense Natl. Stockpile	NJ	DLA	Severe-17	(No class)	
Picatinny Arsenal	NJ	AMC	Severe-17	(No class)	
ARDEC - Picatinny Arsenal	NJ	AMC	Severe-17		
Fort Dix	NJ	FORSCOM	Severe-15	(No class)	
Fort Monmouth	NJ	AMC	Severe-17	(No class)	
Military Ocean TML Bayonne	NJ	MTMC	Severe-17		
Sea Girt	NJ	NGB	Severe-17	(No class)	
Camp Smith Training Site/CSMS	NY	NGB	Severe-17		
Fort Hamilton	NY	FORSCOM	Severe-17		
Fort Wadsworth	NY	TRADOC	Severe-17		
Stewart Annex	NY	USMA	Severe-17		
West Point Military Reservation	NY	USMA	Severe-17		

**Notes:** MACOM = major command; AAP = Army Ammunition Plant; RD&E = research, development, and evaluation; AMC = Army Materiel Command; ARDEC = Armament Research, Development, and Engineering Center; NGB = National Guard Bureau; TRADOC = Training and Doctrine Command; DLA = Defense Logistics Agency; FORSCOM = Forces Command; HSC = Health Services Command; MDW = Military District of Washington; MTMC = Military Traffic Management Command; USMA = U.S. Military Command; TACOM = Transportation and Armaments Command. See Table E-2 for definitions under O2, CO, and SO2 classes.

Blanks under column headings indicate those areas are attainment areas, have not been evaluated, or are moderate or marginal. There were no installations recorded above the median for Particulate with Aerodynamic Diameter <10 microns Class (PM10).

**Table E-1****Projected National Ambient Air Quality Standards Nonattainment Status for Department of the Army Activities (Continued)**

Installation name	State	Current MACOM	Class		
			O2	CO	SO2
Camp Adair	OR	NGB	(No data)		
Defense Personnel Support Center	PA	DLA	Severe-15		
Letterkenny Army Depot	PA	AMC	(No data)		
Oakdale Spt. Fac. (Chas. E. Kelly)	PA	FORSCOM		(No class)	Primary
Melville Defense Fuel Support Point	RI	DLA	Serious		
William Beaumont Army Medical Ctr.	TX	HSC	Serious		
Fort Bliss	TX	TRADOC	Serious		
Camp Williams	UT	NGB		(No class)	Primary/Sec
Dugway Proving Ground	UT	AMC			Primary/Sec
Fort Douglas	UT	FORSCOM		(No class)	Primary/Sec
Tooele Army Depot	UT	AMC			Primary/Sec
Arlington Hall Station	VA	INSCOM	Serious		
Cameron Station	VA	MDW	Serious		
Fort Belvoir	VA	MDW	Serious		
Fort Myer	VA	MDW	Serious		
Yakima Training Center	WA	FORSCOM		(No class)	

Notes: MACOM = major command; AAP = Army Ammunition Plant; CSMS = ; RD&E = research, development, and evaluation; AMC = Army Materiel Command; ARDEC = Armament Research, Development, and Engineering Center; NGB = National Guard Bureau; TRADOC = Training and Doctrine Command; DLA = Defense Logistics Agency; FORSCOM = Forces Command; HSC = Health Services Command; MDW = Military District of Washington; MTMC = Military Traffic Management Command; USMA = U.S. Military Command; TACOM = Transportation and Armaments Command. See Table E-2 for definitions under O2, CO, SO2 classes.

Blanks under column headings indicate those areas are attainment areas, have not been evaluated, or are moderate or marginal. There were no installations recorded above the median for Particulate with Aerodynamic Diameter <10 microns Class (PM10).

**Table E-2**  
**National Ambient Air Quality Standards Nonattainment Status Codes**

<b>Key to National Ambient Air Quality Standards (NAAQS) Nonattainment Classification Codes</b>		
<b>Ozone class (O<sub>2</sub>)</b>	<b>Extreme</b>	Current nonattainment area; major source = 10 ton/yr. VOC or NO <sub>x</sub>
	<b>Severe-17</b>	Current nonattainment area; major source = 25 ton/yr. VOC or NO <sub>x</sub>
	<b>Severe-15</b>	Current nonattainment area; major source = 25 ton/yr. VOC or NO <sub>x</sub>
	<b>Serious</b>	Current nonattainment area; major source = 50 ton/yr. VOC or NO <sub>x</sub>
	<b>Moderate</b>	Current nonattainment area; major source 100 ton/yr. VOC or NO <sub>x</sub>
	<b>Marginal</b>	Current nonattainment area; major source 100 ton/yr. VOC or NO <sub>x</sub>
	<b>(No data)</b>	No data area; nonattainment status required due to past excursions
	<b>(Trans)</b>	Transitional status; nonattainment status required due to past excursions
<b>Carbon dioxide class (CO)</b>	<b>Serious</b>	Current nonattainment area; major source = 50 ton/yr. CO
	<b>Moderate</b>	Current nonattainment area; major source = 100 ton/yr. CO
	<b>(No class)</b>	Unclassified area; nonattainment status retained due to past excursions
<b>Sulfur dioxide class (SO<sub>2</sub>)</b>	<b>Primary</b>	Current nonattainment area; exceeds primary NAAQS
	<b>Secondary</b>	Current nonattainment area; exceeds secondary NAAQS
	<b>Primary/Sec</b>	Current nonattainment area; exceeds primary and secondary NAAQS
<b>Particulate with aerodynamic</b>	<b>Serious</b>	Current nonattainment area; major source = 70 ton/yr. PM <sub>10</sub>
	<b>Moderate</b>	Current nonattainment area; major source = 100 ton/yr. PM <sub>10</sub>

**Note:** VOC = volatile organic compound; NO<sub>x</sub> = Oxides (various) of nitrogen.

# REPORT DOCUMENTATION PAGE

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